DECEMBER 3, 1951

STEEL

THE WEEKLY MAGAZINE OF METALWORKING

A LONG ROW TO HOE IN . . .

Farm Equipment

—page 58

FLICK A SWITCH, PUSH A BUTTON
—Automaticity in Engine Building, p. 82

CLEANING ROOM ECONOMIES
—In Shell Molding They're Numerous, p. 90

MAGNETICALLY CONTROLLED PICKLING LINE
—More Tonnage per Turn, p. 96

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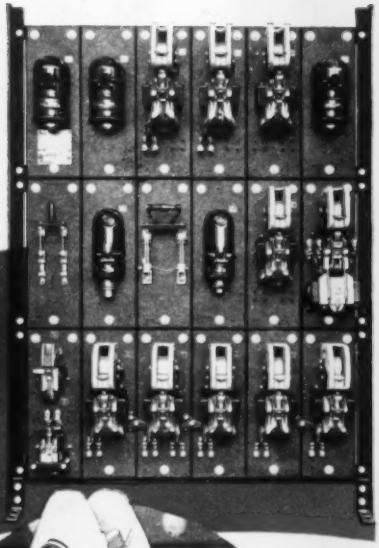
8 *Important Features of* **EC&M** *Magnetic Control*

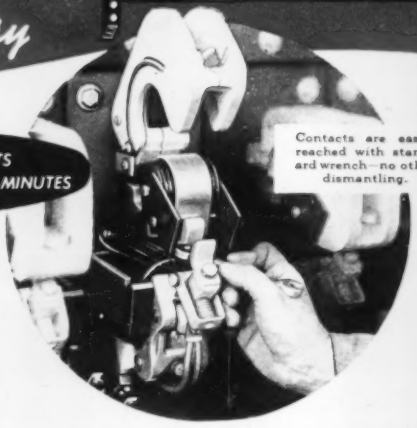
1 Time-Current Acceleration
2 Line-Arc Contactors
3 Wright Hoist Circuit
4 Tab-Weld Resistors
5 Cam Master Switches
6 Safer Electrical Interlocks
7 Bolted, Welded Frame
8 Quick Contact Renewing ✓



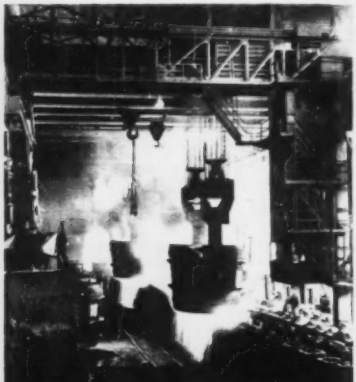
QUICK CONTACT RENEWING

makes maintenance easy

FRONT AND REAR CONTACTS REPLACED IN LESS THAN 2 MINUTES



Contacts are easily reached with standard wrench—no other dismantling.



IT PAYS TO ENCOURAGE MAINTENANCE

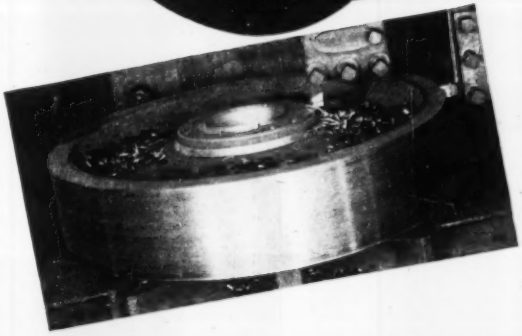
The EC&M *LINE-ARC* principle assures long life of contacts, but when needed, quick contact renewal is easily accomplished. Tests show the time for replacing stationary and movable contacts of EC&M *LINE-ARC* Contactors averages less than two minutes.

Note that a standard wrench may be used which gives good leverage for both loosening and tightening operations. There are no other contactor parts which must first be removed to make the contact tips accessible. EC&M Magnetic Control encourages good maintenance.

THE ELECTRIC CONTROLLER & MFG. CO.

2698 EAST 79TH STREET • CLEVELAND 4, OHIO

THEY'RE GOOD, CLEAN, SOLID STEEL



Yes, all the way through, from outer rim to hub, these Bethlehem blanks are good, clean, solid metal—solid steel.

Frankly, we go all out to make them strong. Starting with choice steel from selected heats, we forge and roll the blanks in a single operation. This unique process combines, in the finished piece, the strength of a forged part and the smoothly-flowing grain of a rolled one. As a result, thinner sections are often possible, so that considerable savings in weight can be made.

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Bethlehem blanks are especially good for heavy-duty applications, such as gears, crane and sheave wheels, turbine rotors, flywheels, tire molds, etc. Sizes range from approximately 10 in. to 42 in. OD, with heat-treating optional. Write for Booklet 216; it contains many pictures and will give you scores of details that we haven't room for here.

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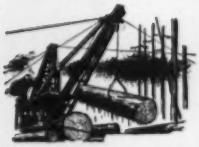


For logging

For sand and gravel

For aircraft

For marine

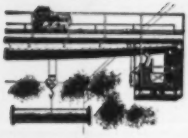
For construction

For stone quarries

For elevators

For mining

For drilling



For industrial

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A THOUSAND AND ONE

to order from assures the right rope for your equipment

There is a Macwhyte Wire Rope that has been specially engineered and job-proved for any particular type of equipment you operate. That's why it pays to specify Macwhyte. Over the years, ropes for all types of equipment in every field have been developed by Macwhyte. Recommendations are promptly available either from Macwhyte distributors or Macwhyte Company, 2912 Fourteenth Avenue, Kenosha, Wisconsin.

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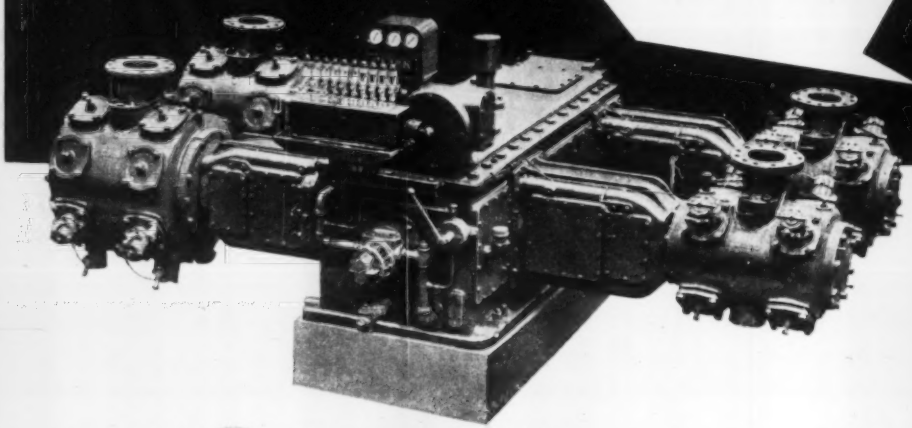
"Wire Rope—So What?" (No. 5134)—Illustrated exclusive interview with veteran wire rope engineer who talks straight from the shoulder about saving hundreds of wire rope dollars.

"How to Order Wire Rope" (No. 5025)—Tells exactly what to consider. Also includes convenient table of sizes, constructions, strengths and weights of Improved Plow Steel Wire Ropes.

Mill depots: New York • Pittsburgh • Chicago • Minneapolis • Fort Worth • Portland • Seattle • San Francisco • Los Angeles. Distributors throughout U. S. A. and other countries carry stocks.

1010

modernize with a truly modern compressor



For your air compressor requirements in the 150-4500 bhp range, no compressor today . . . *no compressor in history* . . . can match the distinct advantages of the Clark Balanced/Opposed, Motor-Driven line.

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balanced/opposed COMPRESSORS

STEEL

The Weekly Magazine of Metalworking

VOL. 129 NO. 23 DECEMBER 3, 1951

THIS WEEK IN METALWORKING

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Next Week ... **Cerium and Lanthanum Improve Hot Workability of Stainless ... Inventory Control System Effects Tool Crib Savings ... Robot Machinist ... Setup Cleans Gear Housings**

Published every Monday by the Penton Publishing Company, Penton Building, Cleveland 13, Ohio. Subscription in the United States and possessions, Canada, Mexico, Cuba, Central and South America, one year $10; two years $15; all other countries, one year $20. Single copies (current issues) 50 cents. Metalworking Yearbook issue $2.00. Entered as second class matter at the postoffice in Cleveland, under the Act of March 3, 1879.

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Lapping Carbide 20% Faster!

Carbide spray nozzle orifices are finished to tolerances of .0005" at Spraying Systems Company, Bellwood, Illinois. New Elgin DYMO-C diamond abrasive used in place of diamond powder-oil mixture produces more pieces per hour and conserves diamond, too!

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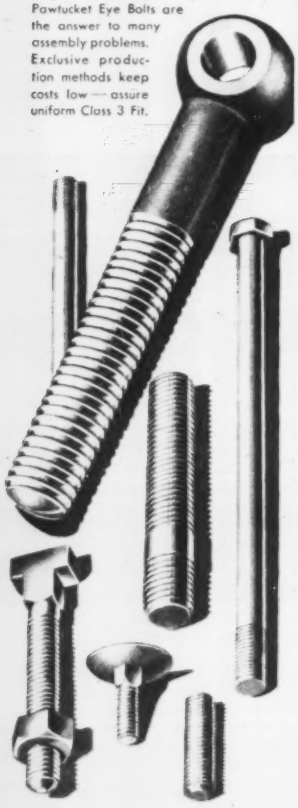

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THE PLACE TO SOLVE YOUR BOLT PROBLEMS

T.M. REG.

Behind the Scenes..

Weekly Movie

We went downstairs last Friday to take a look at a new project initiated by STEEL's editors. It's a weekly movie showing short films on metalworking subjects.

The purpose is educational—to give the editors a broader knowledge of industrial techniques. The 23-minute film we saw was put out by General Motors Corp. and presented the various processes of manufacture involved in the production of quality ball bearings. Other outstanding movies the editors have seen include two from Colorado Fuel & Iron Corp. on the production of rails and wire, one from Lebanon Steel Foundry on steel castings and one from Calument & Hecla Consolidated Copper Co.'s Wolverine Tube Division on the manufacture of tubing.

We decided to have a talk about the project with Managing Editor Walt Campbell. "The whole thing's working out well," he told us. "We've received some excellent industrial films, and the whole expense, aside from the initial cost of the projector and related equipment, is minor."

Many industrial companies, we learned, have libraries of technical movies they're glad to lend out. Most large public libraries also have good selections.

Dangerous Trend

In Cleveland has been undertaken the first college course on television in the country. We think that the whole idea will catch on like wildfire and that eventually people all over the nation will get complete credit toward college degree via telecourses. On the whole, we think that the trend is good. But we have this reservation: We foresee the day when the Channel 4 football team will be in heated rivalry with Channel 5's representatives. And then may come the subsidy deals all over again.

A Matter of Language

Our comments Nov. 19 about long words in the English langauge has brought in a flood of jaw breakers.

It seems that the 28-letter antidisestablishmentarianism which we submitted as the longest is not even in the running. J. W. Caum of American Society for Testing Materials offers the 45-letter pneumonoultramicroscopicsilicovolcanokoniosis which he says his secretary says is a disease contracted by sulphur miners working around volcanoes. We can't find the thing in any of the prosaic references around here, but we bow to superior knowledge. Just to be on the safe side, he also submitted the 39-letter tetramethylolcyclopentanonetetranitrate that may be found in a paper by Soldate and Noyes, Analytical Chemistry, Volume 19, pp. 442-444 (1947).

Robert Huff came forth with a 38-letter tetranitrodimethylbenzidinedinitramine, one of the benzene-insoluble impurities in crude tetryl, found on p. 180 of *Chemistry of Powder & Explosive* by Tenney L. Davis.

Nothing New

Strikes are nothing new, not invented in this disputatious age. Zenon was a chap who worked for King Ptolemy Philadelphus in Egypt 2000 years ago. As manager of a big farm, Zenon was constantly harrassed by the refusal of the peasants to "co-operate." They wouldn't work at times. Instead of resorting to picketing, as now, they repaired to a temple and refused to come out until their demands were met.

What Zenon needed was a labor relations expert.

More About Vulcan

Data keeps pouring in on Vulcan, god of metalworking, about whom we have discoursed at length in previous issues. The most articulate correspondents are those from Birmingham, the proud possessor of a statue of the deity atop Red Mountain.

Bill Austin, program chairman for the Birmingham chapter of the American Society for Metals, informs us that the Birmingham Vulcan now holds a neon lighted torch in his outstretched hand, an accouterment supplied by the local Jaycees. The torch burns red on nights following a fatal traffic accident in the city and green at all other times.

Puzzle Corner

We went to press too early to carry any answers for the Nov 19 puzzle, but the hat buyer's check was for $14.32.

How long will it take a clock to strike ten if it takes seven seconds to strike seven?

Shrdlu

(Metalworking Outlook—Page 45)

FASTER SHELL BANDING

Proof again that you get better results on an amazing range of jobs, with the oil-smooth speed and *power control* of

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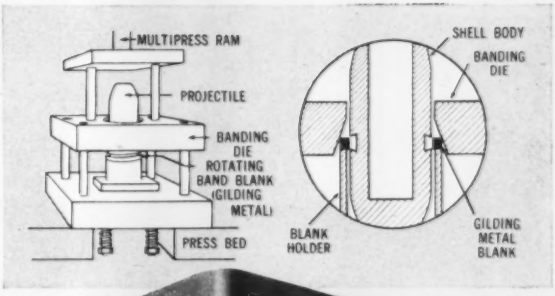

At speeds up to double those attained by other methods today, the Multipress at right brings new precision to shell-banding operations.

Combining its rapid, fully controlled "continuous squeeze" action with a tapered, solid die, Multipress assures uniform metal flow in contracting banding rings . . . reduces chance for metal fracture . . . eliminates work-hardening of metal . . . provides uniform radial pressures around the entire band . . . leaves no parting marks as dies are raised. In addition, the Multipress equipment requires less space than most other shell-banding equipment.

This new Multipress shell-banding process is applicable to projectiles of almost any size. Quick, easy tool changes adapt the press shown here to 20mm, 75mm, 76mm, 90mm, 105mm, 120mm and other shell sizes.

QUICK CONVERSION — to an enormous range of jobs calling for accurate speed and pressure — is an established Multipress advantage. Eight frame sizes can be equipped for almost any ram action or operating sequence. Manual or automatic controls. Automatic Multipress Index Tables and other accessories available for special needs. Capacities from one ton to fifty tons. Write for full details.

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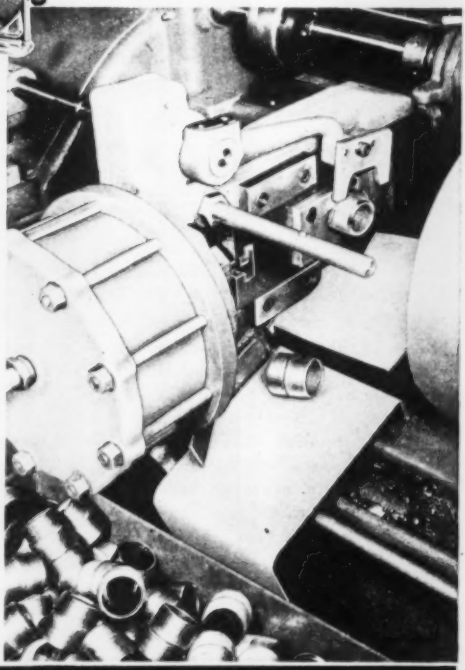
A REVOLUTIONARY NEW DEVELOPMENT

CLOSE & ... SHORT NIPPLES

threaded in one automatic operation

Formerly the production of close and short nipples was featured by high labor cost, low output and tedious manual handling. NOW . . . here is a modern machine tool which mass-produces these nipples in a single continuous automatic operation.



The LANDIS Automatic Close Nipple Threading Machine, recently perfected by Landis Thread Engineers, will produce commercial standard close, short, and special short nipples at rates ranging up to 625 per hour. These machines are built in two size ranges—one for ½" to ¾" nipples—the other for 1" to 2" nipples.

This new LANDIS Close Nipple Machine is completely automatic—threading, reaming, and chamfering close nipples on both ends without secondary manual handling. Nipple blanks are fed from a magazine, transferred automatically from one carriage to the other, and ejected when finished.

Tremendous savings in labor cost can be realized—PLUS other savings through lower tool cost and increased production. The operator is required only to fill the magazine and give supervisory attention. Thus a SINGLE operator can handle TWO OR THREE LANDIS Close Nipple Machines, depending on the pipe size.

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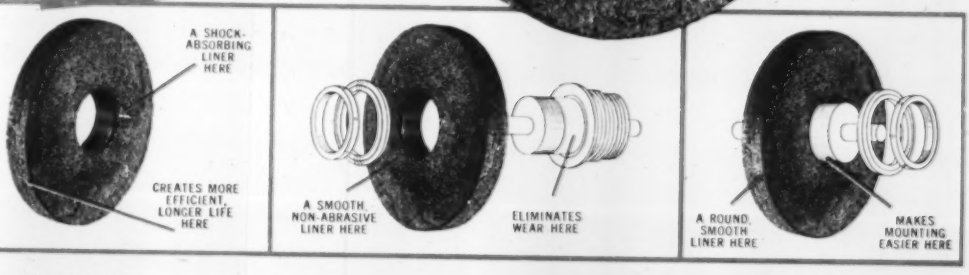
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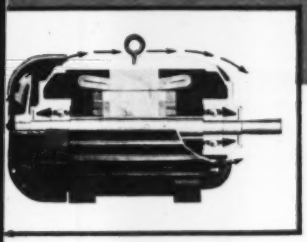


Arrows show how the slipstream from the fan continually blows away heat and keeps cooling surfaces free of dirt.

Dust, fumes and moisture can't get into the C-W Sealedpower motor. This one was run in an atmosphere of fan-driven French chalk, yet not a trace was found inside.

The motor that keeps itself cool and clean...

You'll find it profitable to standardize on the Crocker-Wheeler Sealedpower for all applications that call for totally-enclosed motor in the 2 to 100 hp range. For this C-W motor *assures cooler running with minimum maintenance.*

It runs cooler because the distinctive finned housing adds *150% more cooling surface*—and because the integral fan continually blows a stream of cooling air over the entire cooling surface.

As for maintenance—the design is such that dust, fumes and moisture simply can't get inside, while the continual blast of air along the fin surfaces keeps the outside clean. Under normal conditions you never need to shut down an Elliott C-W Sealedpower motor for cleaning.

SEND FOR THIS BULLETIN

It describes all the features that assure you of *top performance with rockbottom operating and upkeep costs* from every C-W Sealedpower motor you install. Write today and ask for Sealedpower Bulletin SL-300-2A. Address your request to *Elliott Company, Dept. S, Jeannette, Pa.*

The Elliott C-W Sealedpower motor is available also in explosion-proof construction. Bulletin SL-300-5 covers this type. Copy on request.

Crocker-Wheeler motors range from 1 to 200 hp. Larger Elliott motors and generators are built by the Ridgway Division in Ridgway, Pa.

CW-19

ELLIOTT COMPANY

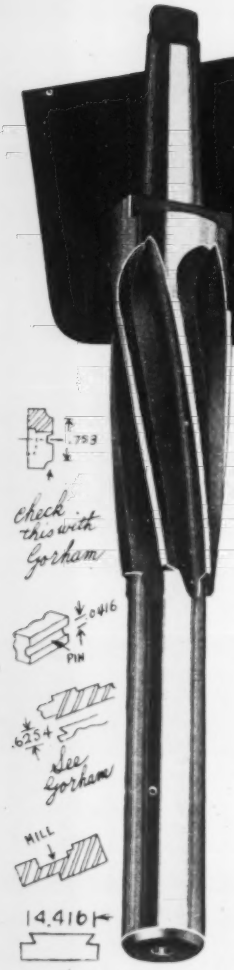
GENERAL OFFICES & MAIN PLANT—JEANNETTE, PA.

CROCKER-WHEELER DIVISION

Ampere, N. J.

BRANCH OFFICES AND REPRESENTATIVES IN PRINCIPAL CITIES

ELLIOTT *Approved* SERVICE SHOPS COVER THE COUNTRY



Turn problems into *profits*

with GORHAM-Engineered Special Cutting Tools

For fast, practical solutions to tough tooling problems, call in the expert . . . your nearby Gorham Field Engineer! He provides a complete engineering service to determine your exact tooling requirements. For instance:

•

He starts with your product, sketch or idea.

•

He surveys your production operations and your available equipment.

•

He considers work material properties and desired finishes and tolerances.

•

He plots proper machine feed, speed and method of tool driving.

•

then . . . he develops practical design and engineering specifications for a special cutting tool, metallurgically "tailor-made" for your application.

•

. . . *and* his recommendations are backed by Gorham's unmatched facilities! These include three fully-equipped manufacturing plants, large Engineering and Metallurgical staffs, and the finest heat treating equipment.

These resources, plus Gorham's more than thirty years' reputation for producing the finest cutting tools, are dedicated to furnishing prompt and profitable solutions to your special tooling problems. Gorham-engineered "specials" are turning problems into profits in thousands of plants every day . . . why not let them do the same for *you?*

If you haven't met your nearby Gorham field Engineer, write for his name, or send details of your problem direct for recommendations.

Gorham TOOL COMPANY

"EVERYTHING IN STANDARD AND SPECIAL CUTTING TOOLS"

14401 WOODROW WILSON • DETROIT 3, MICHIGAN

LETTERS
TO THE EDITORS

Exporting Information

STEEL's weekly "Contract Award Summary" lists contracts for defense work which can be subcontracted. Would it be possible to obtain a complete list of contract awards?

. . . . also, can you advise where and how I may be advised of the dates of coming conventions of engineering and technical organizations?

W. L. Higgins
industrial consultant
Yokosuka, Japan

• *The list of contract awards can be obtained from U. S. Department of Commerce, Washington, D. C. Ask for the "Consolidated Synopsis of Contract Award Information." STEEL's Metalworking Yearbook issue, which will be published Jan. 7, 1952, will contain a composite list of meetings scheduled for the coming year. This list will contain approximately 150 meetings concerning the metalworking industry.*

Suggestion Department

We are suggesting an addition to the regular listings dealing with the Steel industry. We believe that if a small space were set aside for a log of strikes in the steel industry to show when they started, when ended and what facilities were affected, it would be helpful. This log should, of course, show the name of the steel company affected and should carry data covering the maximum of one year.

D. M. Baker, purchasing agent
Day Brite Lighting Inc.
St. Louis

• *This is a good possibility. What do other* STEEL *readers think?*

Who, What and Where

On p. 93 of Nov. 5 issue of STEEL, there is a reference to an "electrolizing" process for producing a hard thin case on cutting tools. Can you tell us who sells this product?

Sidney J. Block, metallurgist
Process Engineering Department
Brown-Lipe-Chapin Div.
General Motors Corp.
Syracuse, N. Y.

• *Electrolizing Co., 1149 East Pico Blvd., Los Angeles 21.*

Coming From California

Under the caption "California Note" (STEEL, Nov. 5, p. 93) you write of a plastic window coating called infropake. Can you give us the name of the manufacturer of this material?

A. M. Merrifield
general sales manager
All Power Manufacturing Co.
Montebello, Calif.

• *Infropake Pacific Coatings Inc., 814 North La Brea Ave., Los Angeles 38.*

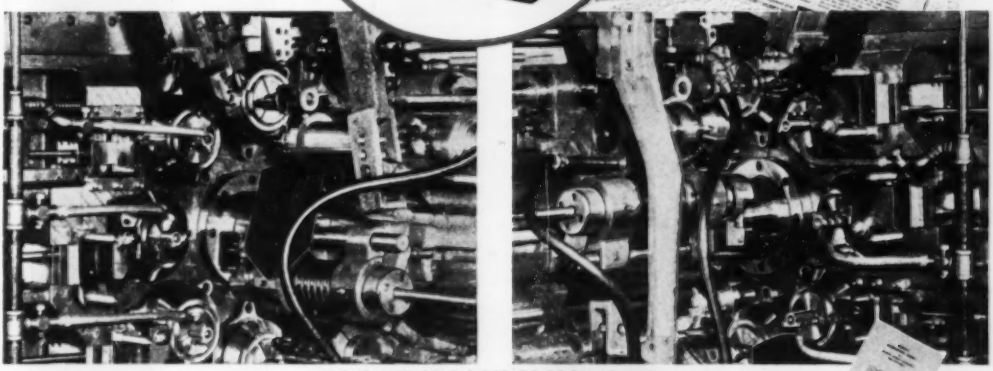
THE HEAT IS ON THE "AUTOMATIC"

For over fifty years American Mass Production has given increasing opportunity to the Multiple Spindle Bar Automatic. But now the heat is really on!

Not the early day flash fire, nor the production pressure kind, but *induction hardening* and *quenching*. The application is performed in one position of an otherwise orthodox setup on an eight spindle CONOMATIC, in the production of universal joint bearing races and wing bushings.

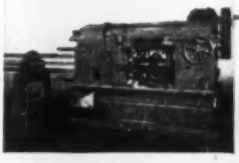
The documentary importance of this application is substantiated by feature articles which appeared in three of the Metalworking Industry's leading publications. Reprints are available at no charge. Just ask your CONE Representative or contact us direct.

Any usual, or unusual, job on an "Automatic" must run or fail. CONOMATICS give the dependable performance that make the innovationary type of job pay off and result in additional assignments.



FRONT AND REAR SIDES OF TOOLING AREA

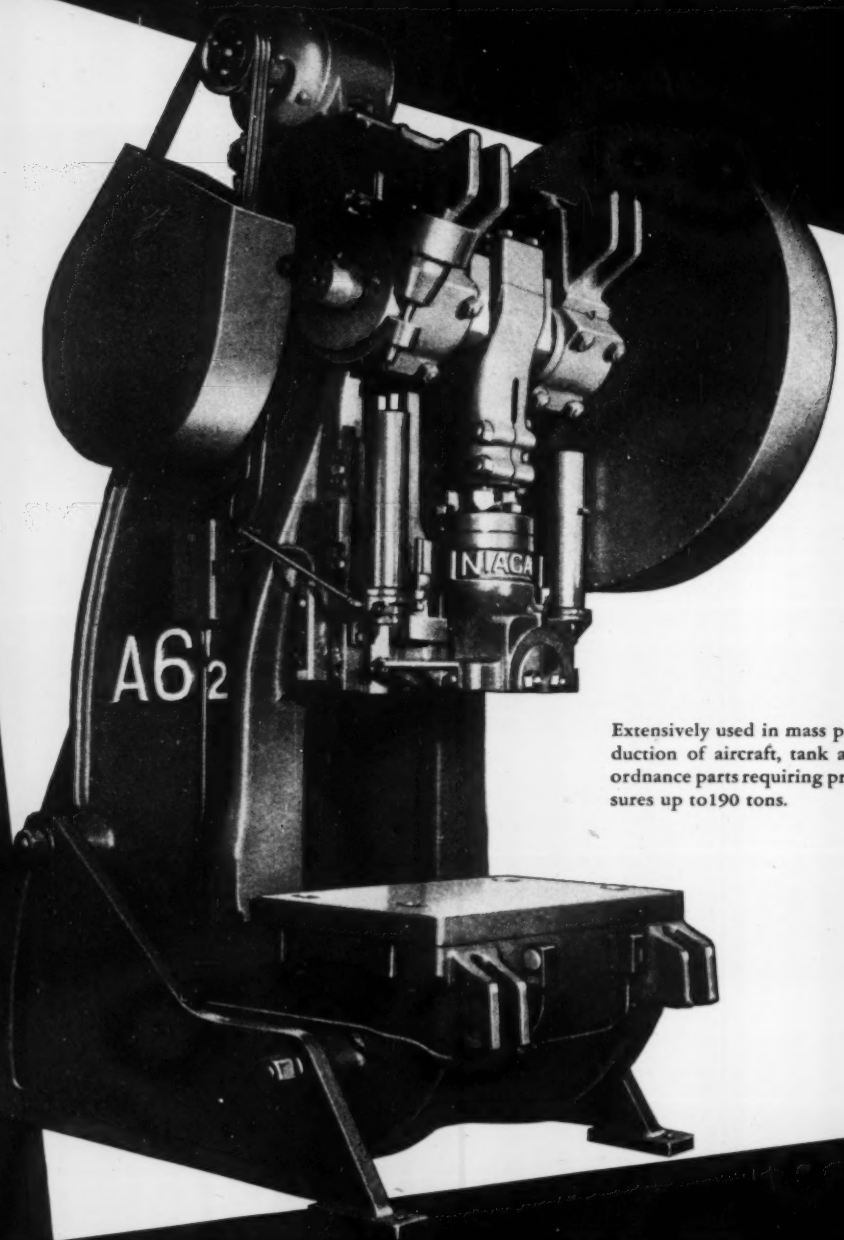
A Comparison of ALL Automatics is in favor of Cone



Conomatic

CONE AUTOMATIC MACHINE COMPANY, INC.
WINDSOR, VT., U.S.A.

NIAGARA



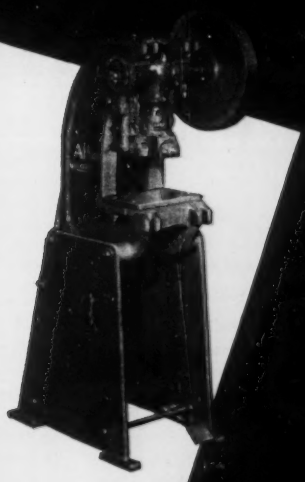
Extensively used in mass production of aircraft, tank and ordnance parts requiring pressures up to190 tons.

NIAGARA MACHINE & TOOL WORKS · BUFFALO 11, N. Y.

A COMPLETE LINE
of
INCLINABLE PRESSES

13 SIZES...
6½" to 1¼" Diameter Shafts

For your defense contract work, get Niagara presses to insure maximum output, long die life and uninterrupted production.



Widely employed in quantity production of small components for the aviation, ordnance and electronics industries.

Manufacturers of a complete line of sheet metal working equipment ranging from small hand tools up to large power operated machinery.

DISTRICT OFFICES: DETROIT • CLEVELAND • NEW YORK

America needs more Steel—
SCRAP
Sell scrap iron and steel NOW! Clean up your plant and help America.
Call your local scrap dealer today.

Will Make More Steel!

America's steel-producing industry is straining every muscle to make all the steel needed for both defense and essential civilian uses. The industry has the men, the furnaces and the mills for the job—*but*

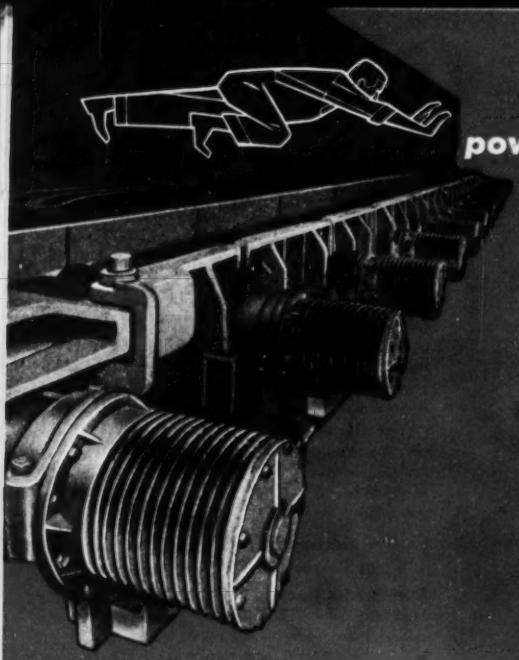
IT MUST HAVE MORE SCRAP!

The half-ton of scrap needed for every ton of finished steel *must* be kept moving to the mills—or steel production will drop. Scrap is in short supply. Unless every available bit of iron and steel scrap is combed out and sent to the mills you'll soon read of curtailed production. And this must not happen!

Go through your plants, warehouses and yards. Seek out every worn-out or obsolete machine, every bit of iron or steel that is not working. Get it in to your scrap dealer *NOW*. The need is urgent.

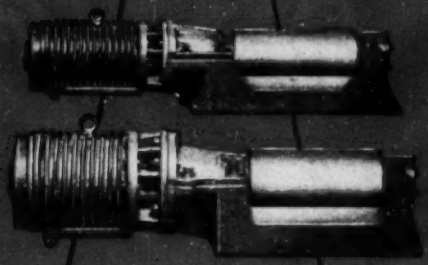
WEIRTON STEEL COMPANY
WEIRTON, WEST VIRGINIA

NATIONAL STEEL CORPORATION



powerful helper for

rolling and pipe mills



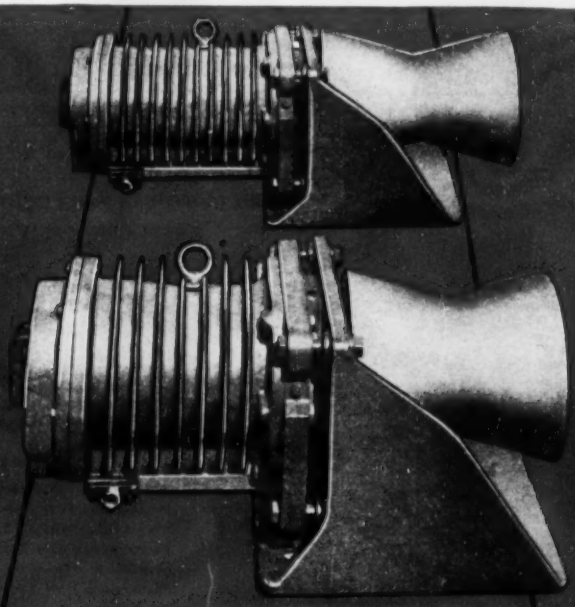
LOEWY

INDIVIDUALLY-DRIVEN MOTOR ROLLER UNITS

for heavy-duty service wherever Roller Tables are required

CHECK THESE EXCLUSIVE FEATURES!

- ☑ **AUTOMATIC SPEED CONTROL**
  Adjusts automatically to weight of load. Individual rollers directly motor driven; no couplings, reduction or bevel gears.
- ☑ **SPECIALLY DESIGNED LOEWY MOTOR**
  Extra sturdy, shockproof, heavy antifriction bearings. Need for flexible couplings eliminated.
- ☑ **LOW INERTIA ROTOR**
  Ideally suited to constant start-stop operation. Can be safely stalled under full load. Stator insulated to withstand up to 350° F.
- ☑ **REDUCED OPERATING COSTS**
  No special maintenance crews needed. One or two spare rollers sufficient for upkeep of entire installation. Units consume less current than any other roller conveyor.
- ☑ **TABLE FORMS PERMIT FLEXIBLE ARRANGEMENT**
  Straight or curved lines may be readily formed and can be easily broken into individually controlled groups. Free passage is possible between rollers, a feature especially valuable for finishing departments.



LOEWY ROLLING MILL DIVISION

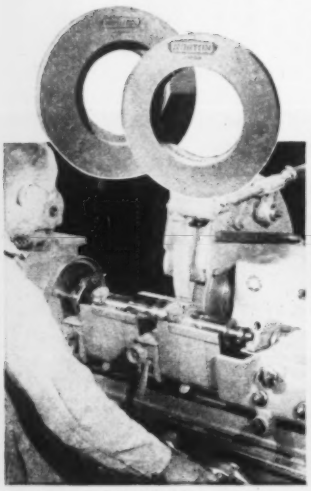
HYDROPRESS INC.

ROLLING MILLS AND ROLLING MILL EQUIPMENT

566 Lexington Avenue General Electric Bldg. at 51st Street New York 22

CHICAGO • DETROIT • SAN FRANCISCO • SEATTLE • WASHINGTON, D. C.

Protect YOUR O.D. GRINDING INVESTMENT with Norton Wheels



Roll-grinding to a super-fine finish

Roughing drill rod in through-feed centerless grinding

No chain can be stronger than any of its links — and no grinding machine can be more efficient than its grinding wheels.

That's why your choice of wheels for O.D. grinding — cylindrical or centerless — calls for every bit as much care as your choice of machines. Because without the *right* wheels the costliest equipment is just so much inefficient machinery. And remember:

No matter what your O.D. grinding jobs are, Norton makes wheels that are exactly right for them. And your Norton Distributor is ready to tell you exactly which wheels you need.

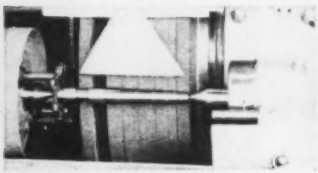
Norton Safeguards for Lower-Cost Grinding

Norton Abrasives, ALUNDUM* (fused alumina) and CRYSTOLON* (silicon carbide) are made in a variety of types and grain sizes for best results on every material handled in centerless or cylindrical grinding.

Norton Bonds, vitrified, resinoid, shellac and rubber are available for cool, free cutting action, extra long wheel life and just the finish you want.

Norton Service includes the most comprehensive applicational aid in the field. And if your problems are unusual, your distributor can call on a Norton Abrasive Engineer to give you double assurance of the right wheel for every job.

These O. D. Grinding Machines Are Paying Off... WITH NORTON WHEELS



Wheels *must* be uniform in this cylindrical setup for grinding seven diameters at once

Multiple diameter centerless grinding also requires high standards of wheel uniformity

Cylindrical shoulder grinding, with 45° angular wheel head

Through-feed centerless grinding gives high production

GET THE FACTS YOU NEED TO KNOW

This 40-page illustrated booklet is packed with up-to-the-minute information on every phase of cylindrical and centerless grinding applications, including handy selection charts for your general guidance. Ask your Norton Distributor for *The A.B.C. of O.D. Grinding*, or write direct for Form 2006. NORTON COMPANY, Worcester 6, Mass. Distributors in all principal cities.

*Trade-Marks Reg. U. S. Pat. Off. and Foreign Countries

NORTON ABRASIVES

Making better products to make other products better

When We Sell Wire WE GIVE SERVICE

There's more than quality steel in Continental wire—there's service . . . the kind of helpful service that frequently results in the saving of both time and money for our customers. Continental takes a personal interest in every customer. We make it a point to provide exactly the right grade or temper of wire for a specific need. Our many years of experience in producing wire for more than a thousand uses often enables us to provide wire users with practical and beneficial advice that helps them build better products. Our location and size permit this close, family relationship and make us a select wire source for our customers.

CONTINENTAL STEEL CORP.
STEEL
*CONTINENTAL
REG. U.S. PAT. OFF.
WIRE
KOKOMO, IND.

Special Wire Shapes For Special Applications

Many of our customers find that shaped wire helps them trim costs and add sales appeal to otherwise ordinary products. Providing wire in special shapes is another Continental service for its customers.

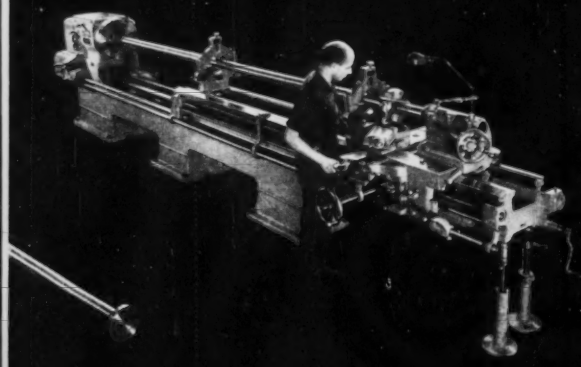
*Trade Marks Reg. U.S. Pat. Off.

CONTINENTAL STEEL

CONTINENTAL STEEL CORPORATION

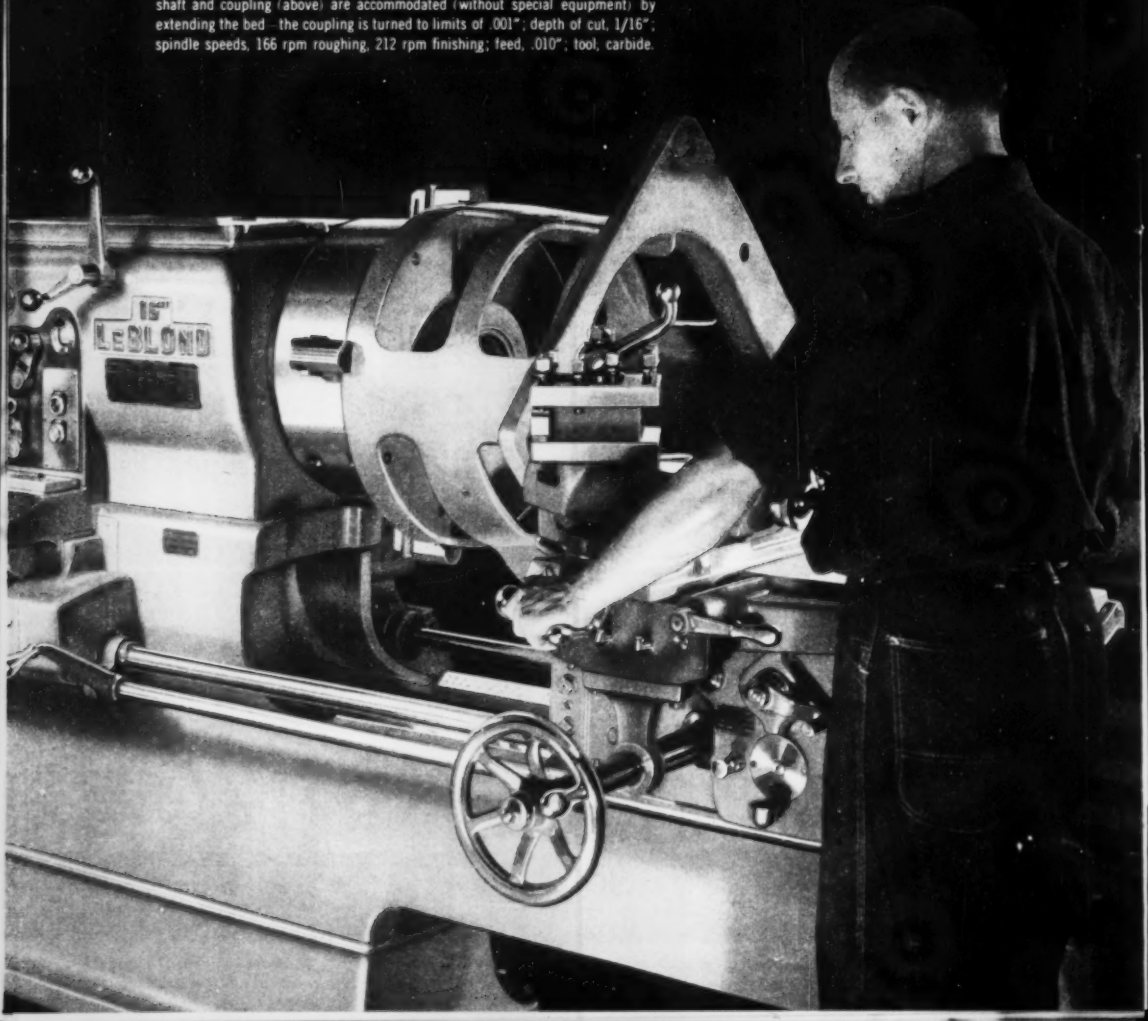
GENERAL OFFICES • KOKOMO, INDIANA

PRODUCERS OF *Manufacturer's Wire* in many sizes, shapes, tempers and finishes, including Galvanized, KOKOTE, Flame-Sealed, Coppered, Tinned, Annealed, Liquor Finished, Bright, Lead Coated, and special wire. ALSO, Coated and Uncoated Steel Sheets, Nails, Continental Chain Link Fence, and other products.

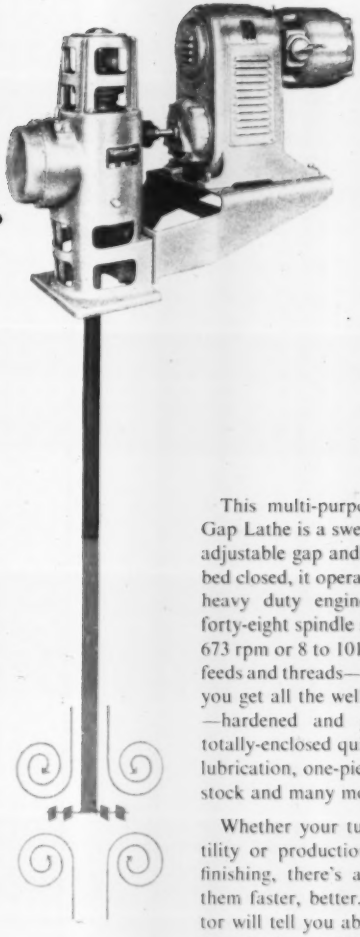


giant

Versatility of this new LeBlond 16"/38" Sliding Bed Gap Lathe is demonstrated at Mixing Equipment Co., Inc., Rochester, New York. The irregularly-shaped semi-steel base (below) swings 33", overhangs 18"—depth of cut (intermittent), 3/32"; spindle speed, 86 rpm; feed, .014"; tool, carbide. The 14' AISI 304 stainless steel shaft and coupling (above) are accommodated (without special equipment) by extending the bed—the coupling is turned to limits of .001"; depth of cut, 1/16"; spindle speeds, 166 rpm roughing, 212 rpm finishing; feed, .010"; tool, carbide.



"eggbeaters" for industry



These huge mixers (up to 500 hp) do a big job of "eggbeating" for industry. They're used to blend chemical formulations—to mix pulp for paper—to combine ingredients for thousands of everyday products.

In producing these mixers, Mixing Equipment Co., Inc. of Rochester, New York, has to turn a variety of work . . . from short parts with irregular swings up to 33", to shafts as long as 14'—materials from brass to stainless steel—intermittent cuts to heavy roughing cuts to smooth finishing cuts—tolerances down to .001". All this calls for a rugged precision lathe of unusual versatility. That's why Mixing Equipment Co., Inc. installed a new LeBlond 16"/38" Heavy Duty Sliding Bed Gap Lathe, recommended by LeBlond Distributor, F. W. Schiefer Machinery Company of Rochester.

This multi-purpose LeBlond Sliding Bed Gap Lathe is a sweetheart in the shop. It has adjustable gap and center distance, and with bed closed, it operates the same as a standard heavy duty engine lathe. Twenty-four or forty-eight spindle speeds are available, 11 to 673 rpm or 8 to 1010 rpm, respectively—sixty feeds and threads—up to 15 hp. And of course you get all the well-known LeBlond features—hardened and ground steel bed ways, totally-enclosed quick-change box, automatic lubrication, one-piece apron, thrust-lock tailstock and many more.

Whether your turning jobs call for versatility or production, heavy hogging or fine finishing, there's a LeBlond Lathe to turn them faster, better. Your LeBlond Distributor will tell you about the three Sliding Bed Gap Lathes, 16"/38", 25"/50" and 32"/60". Call him or write—

THE R. K. LEBLOND MACHINE TOOL CO., CINCINNATI 8, OHIO

Ask for Bulletin SBG 103 G for complete information on LeBlond Heavy Duty Sliding Bed Gap Lathes.

turned faster by **LeBLOND** *of Cincinnati*

WORLD'S LARGEST BUILDER OF A COMPLETE LINE OF LATHES • FOR MORE THAN 64 YEARS

Economy Packages

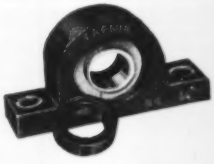
PILLOW BLOCKS
Light Series

Typical Fafnir "packaged" ball bearing units.

PILLOW BLOCKS
Medium and Heavy Series

CARTRIDGES
Light and Heavy Series

PILLOW BLOCKS
Fixed and Floating Types



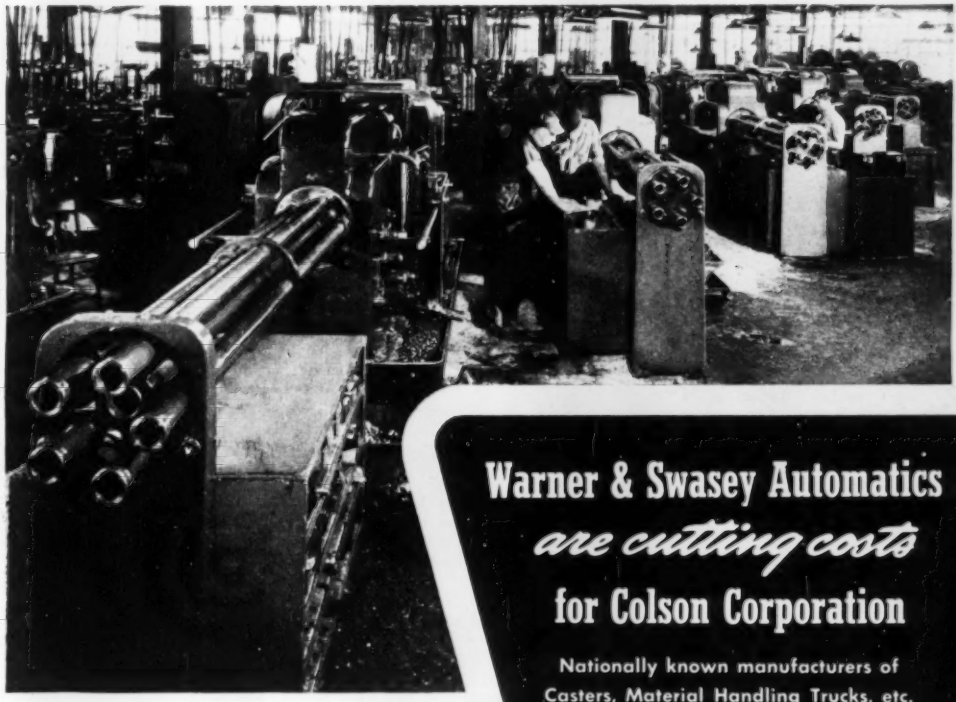
RUBBER UNITS

FLANGETTE

If you make machinery or equipment you know the magic selling-power of a tag on your product saying "Ball Bearing Equipped". ✓ ✓ ✓ Much as you would like to add the selling plus of ball bearings to your own product it is not always a simple matter to change over from less efficient bearings. ✓ ✓ ✓ Fafnir has gone a long way to help you gain these advantages by "packaging" ball bearings in complete units, including housings, seals and shields, in shapes and sizes to fit an amazing variety of machines and equipment and to function properly under all types of operating conditions. ✓ ✓ ✓ A few minutes spent with a Fafnir engineer may bring forth an Economy Package which gives you all the advantages of ball bearings at minimum cost. The Fafnir Bearing Company, New Britain, Conn.

FAFNIR
BALL BEARINGS

MOST COMPLETE LINE IN AMERICA



Warner & Swasey Automatics *are cutting costs* for Colson Corporation

Nationally known manufacturers of Casters, Material Handling Trucks, etc.

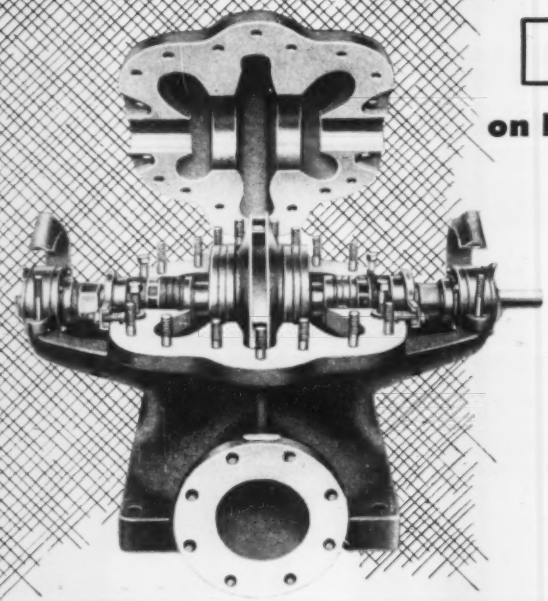
Five of seven Warner & Swasey 5-Spindle Automatic Bar Machines in operation at Colson Corporation, Elyria, Ohio.

THE COLSON STORY

- ★ Setup time cut more than 50% on new Warner & Swaseys.
- ★ Production up 7 to 8 times on lots of 500 to 10,000 pieces.
- ★ "Progressive" setups are much more practical on Warner & Swaseys.
- ★ Small lots are economically practical on this new CAMLESS Automatic.
- ★ Machine operators appreciate easy access and interchangeability of tooling.
- ★ Both management and operators approve—NO CAMS TO CHANGE.
- ★ Five repeat orders prove the profitability of Warner & Swaseys.

WARNER & SWASEY *Cleveland*

YOU CAN MACHINE IT BETTER, FASTER, FOR LESS WITH WARNER & SWASEY TURRET LATHES, AUTOMATICS AND TAPPING MACHINES



the *Inside* Story

on Better Pumping Performance

Look at the "insides" of a Fairbanks-Morse Single-Stage Split-Case Centrifugal Pump.

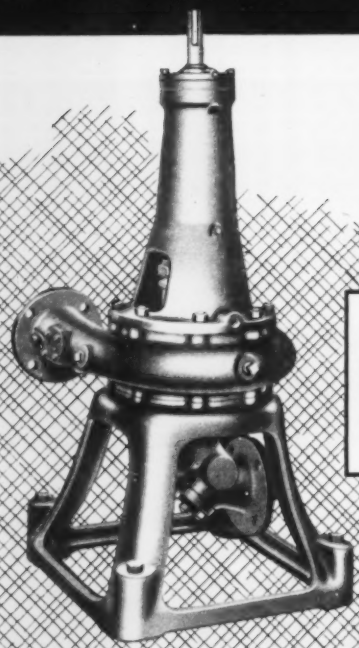
Note how easy it is to inspect or service all working parts . . . the ease with which the entire rotating element can be removed without disturbing driver or pipe connections. It means lower maintenance costs . . . less lost operating time.

Note the sturdy construction and exceptional strength provided by the arched casing and solid pump base . . . the one-piece impeller that reduces wear and maintains efficiency . . . the integrally cast bearing brackets that maintain accurate, permanent alignment of shaft and impeller.

These are but a few of the many performance-making features you'll find that mean more years of efficient, economical service.

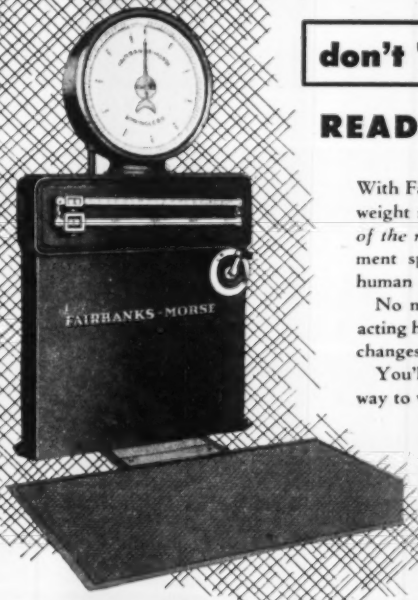
FAIRBANKS

A NAME WORTH



. . . and for another "inside" story, look over the amazing new Fairbanks-Morse "Bladeless" Impeller Pump. Here's the ideal pump where your requirements involve the handling of solids. As indicated in the phantom view of the impeller, there are no "blades" to catch or damage pumped material. Food products, for example, can be pumped without damage.

For process handling applications . . . food, chemicals, in fact any application where products are transported in a liquid, the Fairbanks-Morse "Bladeless" Impeller Solids-Handling Pump will pay dividends in lower costs . . . more efficient operation.



don't "Figure" it . . .

READ it to speed weighing . . . stop errors

With Fairbanks-Morse Direct Reading Cabinet Dial Scales, you read the *correct* weight right at the point of the indicator from zero to full capacity *regardless of the number of drop weights used!* This exclusive Fairbanks-Morse development speeds and simplifies weighing . . . minimizes the chance for costly human error.

No mental calculations are required. Drop weights are applied by an easy-acting hand crank. And as the weights are applied, a revolving disc automatically changes the figures on the chart.

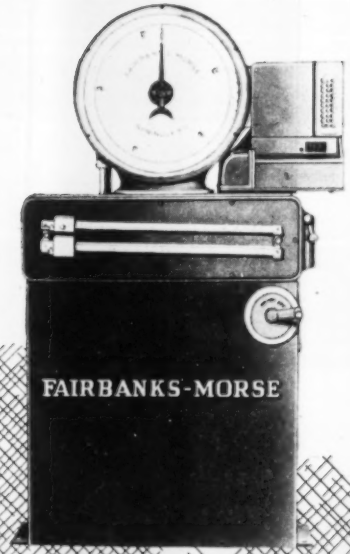
You'll find Fairbanks-Morse Direct Reading Cabinet Dials provide the "easy way to weigh" for sustained accuracy and fast operation.

Here's how the Direct Reading Dial eliminates mental calculations. Illustrated above is a small segment of a dial chart. Without drop weight, the figure in the chart window reads 700 pounds. If one drop weight is applied, the figure in the chart window automatically changes to read 1700 pounds.

-MORSE

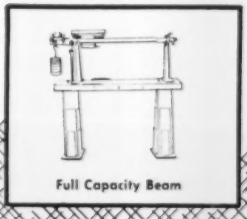
REMEMBERING

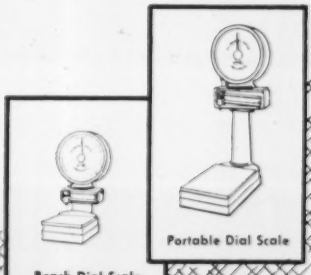
See Next Page for
FAIRBANKS-MORSE
Sales Centers

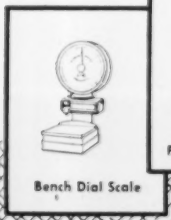


for the ultimate in automatic weighing,

Fairbanks-Morse Direct Reading Cabinet Dials can be equipped with Printomatic Weighers to provide automatic recording of weights on a ticket, roll tape or both. Printomatic recording eliminates the possibility of human error and assures a permanent, accurate record of all weighing operations. In addition to weights, other features such as identifying symbols, time, date, etc., can also be recorded simultaneously. It's the ultimate in fast, accurate weighing.


Full Capacity Beam


Portable Dial Scale


Bench Dial Scale

MOST Advantages for MOST Motor Applications

STANDARD DRIP-PROOF MOTORS FOR YOUR PROTECTION

Practically every motor needs protection—from flying chips, falling particles, dripping liquids, and the like. Also, by far the majority of motors used are of the polyphase, squirrel cage type.

These requirements are met to a unique degree by this series of Fairbanks-Morse motors—with built-in protection and superior electrical and mechanical design that account for their popularity throughout industry.

Whether your motor application problems involve driving pumps, machine tools, compressors, elevators, fans—or any of an infinite number of other applications—Fairbanks-Morse Standard Drip-proof Motors deserve your early investigation. Call your nearest Fairbanks-Morse Sales and Service center.

FAIRBANKS

A NAME WORTH

PROTECTION.. *in any Position*
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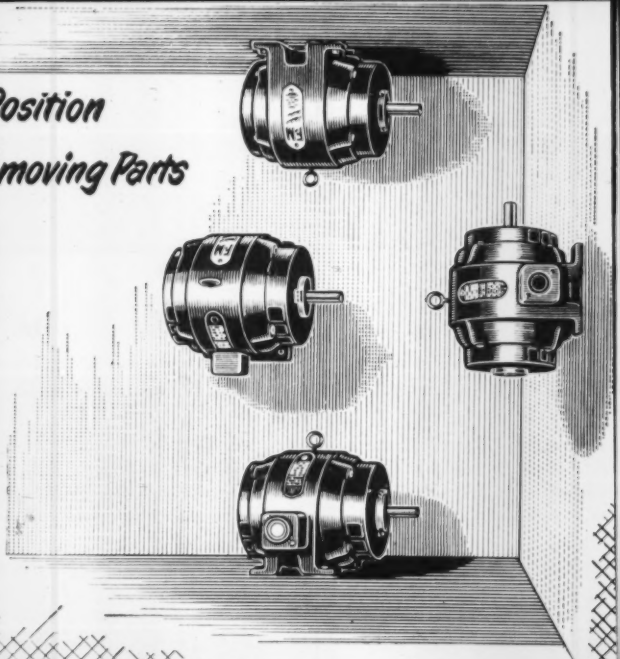

Mount these motors anywhere—even on the ceiling or walls. Bearing arms have four bolts spaced 90° apart, enabling the bearing brackets to be adjusted to assure maximum protection. Motor can be mounted vertically without any changes in bearing construction.

There is complete safety for the operator. Fingers can even be placed in vents, for it is not possible to contact fans due to the protective shield. Smooth, streamlined external contour makes the motor easy to keep clean, easier to maintain.

for MOST Assistance when you need it...

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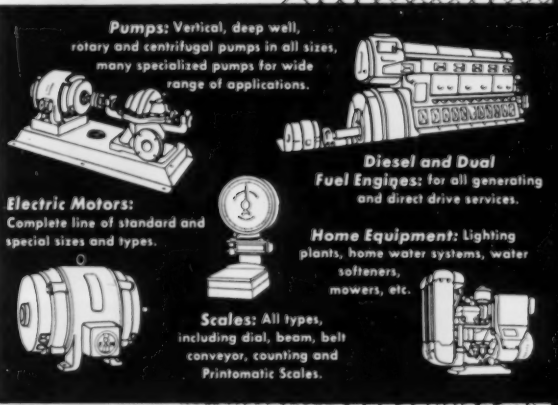
You need all the help you can get these days in procuring new equipment—in obtaining parts and repair service to keep your older equipment running at peak output. You'll find your Fairbanks-Morse Sales Center geared to help you in all these important efforts. It is staffed with factory-trained sales and service personnel, ready to give complete engineering assistance in product maintenance and application.

Unbiased advice is assured, for the Fairbanks-Morse lines of motors, pumps, scales and diesel engines are long and complete: helpful assistance is assured too, for you know you will be dealing with experts in the product in which you are interested.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Electric Motors: Complete line of standard and special sizes and types.
Home Equipment: Lighting plants, home water systems, water softeners, mowers, etc.
Scales: All types, including dial, beam, belt conveyor, counting and Printomatic Scales.

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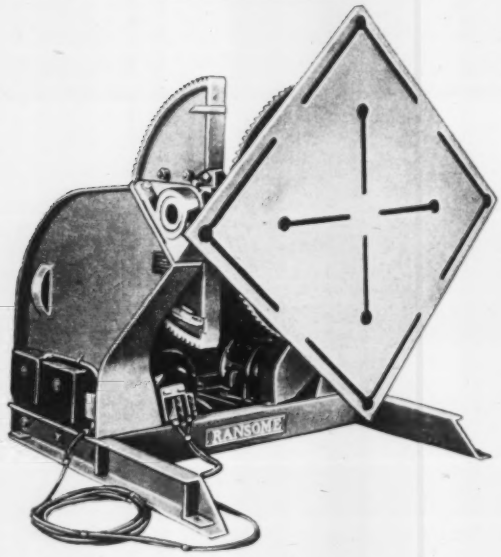
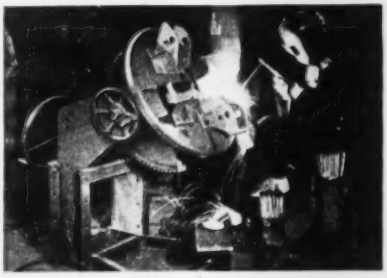




in more production . . . better welds . . . less rod waste

The universal table top makes the Worthington-Ransome Welding Positioner as profitable on *job* work as it is in mass production. Those "T" slots make the table adaptable to any shape of work piece and a wide range of sizes. No special jigs or fixtures needed.

Whether you produce "thousands alike" or "every one different", benefit from *increased arc-time* with Worthington-Ransome Welding Positioners. With just one set-up, the work is clamped to the table top. Then push-button controls or simple hand cranks do the work of tilting or rotating into any position convenient for economical downhand welding. Your welder can continuously weld without costly time and labor wasted in frequent rehandling of the work.

Result—up to 50% more footage, *better* welds (using higher current and heavier rods), less welding rod waste.

Welding positioner capacities from 100 lb to 30 tons. Also: turning rolls from 3 to 150 tons, stationary or self-propelled.

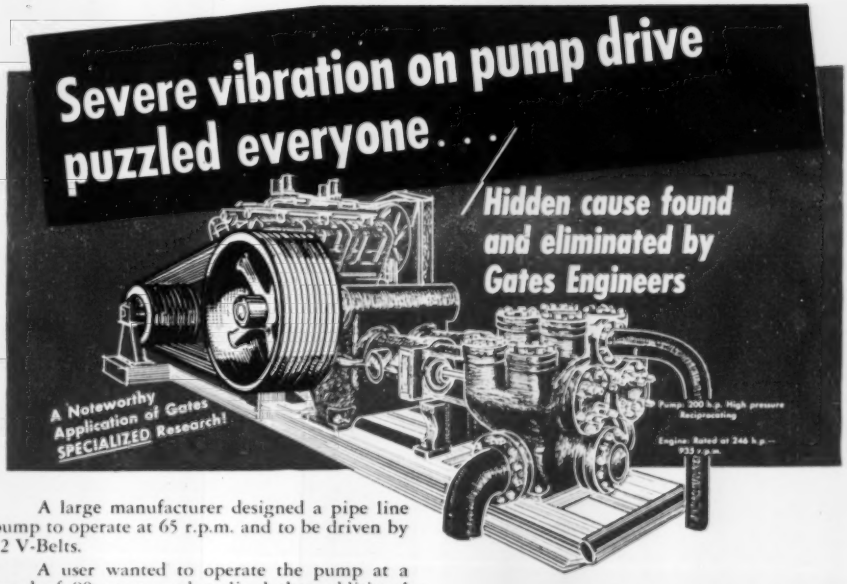
Write Worthington Pump and Machinery Corporation, Dunellen, New Jersey, for bulletins or additional information.

WORTHINGTON

Y.1.2

Severe vibration on pump drive puzzled everyone . . .

Hidden cause found and eliminated by Gates Engineers


A Noteworthy Application of Gates SPECIALIZED Research!
Pump: 200 h.p. High pressure Reciprocating
Engine: Rated at 246 h.p.—935 r.p.m.

A large manufacturer designed a pipe line pump to operate at 65 r.p.m. and to be driven by 12 V-Belts.

A user wanted to operate the pump at a speed of 90 r.p.m. and realized that additional horsepower would be required. Upon checking the V-Belt drive, it was found that the additional belts required would increase the face width of the sheave and therefore the moment arm of the bearing load. Any increase in bearing load combined with the increased speed was distinctly undesirable and therefore the user sought some means of reducing the overhung weight and width of the sheave.

Learning that a *special* V-Belt had a sufficiently higher horsepower rating to gain the greater pump speed with *only 9 belts*, he had the drive re-designed to use these belts.

When installed on the job, the belts vibrated severely. At a speed somewhat below the desired range, the belts would fly completely off the sheaves. Operation was so rough that it was almost impossible to run the pump at all.

Gates Engineers were called in for consultation. Their analysis indicated that the particular belts used formed a *too-compliant* link between the pump and the engine. This allowed tortional vibration to build up to excess. Therefore, belts of *less compliance* would have to be used.

Accordingly, Gates Engineers wrote specifications for belts having the necessary h.p. rating but with the exact *degree of compliance* that would avert the vibration. These special V-Belts were built by Gates—installed—and the drive operates smoothly under all loads and at all speeds within the range.

The excessive vibration is gone. The clutch operates smoothly at any speed. And 13 additional pumps have since been equipped with identical belts—all operating most satisfactorily.

Gates ability to analyze and correct obscure drive difficulties is no accident—for Gates operates the largest V-Belt Testing Laboratories in the world. And Laboratory findings are carefully checked by tests made under actual field conditions. Finally, the *results* of these exhaustive tests are immediately reduced to *usable data* for the design of V-Belt drives to *perform whatever task may be required.*

Phone for a Gates Field Engineer

Only under exceptional circumstances, of course, will you ever need belts of special construction. But, more often, some drive in your plant may not be operating quite as it should. Or you may have a particularly difficult drive to design. Again, you may want to be sure what size and construction of V-Belts will give the most efficient and the lowest cost service on a certain drive. In any case, you have only to phone a Gates Field Engineer, *always near you* in all industrial centers.

Just look in your phone book under "Gates Rubber." A Gates Field Engineer will come right to your plant and put at your service the full benefits of Gates V-Belt knowledge and experience *without the slightest obligation!*

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ELECTROMET Data Sheet

A Digest of the Production, Properties, and Uses of Steels and Other Metals

Published by Electro Metallurgical Company, a Division of Union Carbide and Carbon Corporation, 30 East 42nd Street, New York 17, N. Y. • In Canada: Electro Metallurgical Company of Canada, Limited, Welland, Ontario

How CHROMIUM BRIQUETS Increase Hardness and Strength of Cast Iron

Chromium briquets are made especially for the addition of chromium to cast iron in the cupola. The amount added may vary from small percentages up to as high as 15 per cent.

Function of Chromium in Cast Iron

Chromium is added to cast iron for the purpose of refining the grain and stabilizing the combined carbon content, thus increasing strength, hardness, and resistance to wear and abrasion. Even very small additions of chromium have a decided effect, and as little as 0.25 to 0.50 per cent will yield a great improvement in iron used for resistance to wear. A typical application is in automotive cylinder castings, particularly in heavy-duty truck and tractor work.

The stabilizing and refining effect of chromium is particularly useful to foundrymen producing castings of medium to heavy section. The slow cooling of such castings often results in weak, open-grained iron. Chromium in amounts up to 1.00 per cent will increase the stability of the structure of the castings and help to offset the effect of slow cooling in the mold.

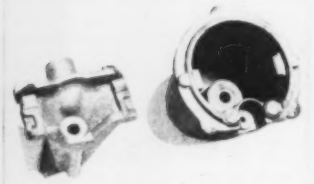

Fig. 1—These low-chromium iron castings, which are parts for a die-casting machine, are machinable, uniformly hard, and resistant to the effect of high temperature.

High-Temperature Service

The strong effect of chromium in stabilizing the structure of gray iron has made its use in iron subjected to high temperatures almost universal. Chromium in the range of 0.75 to 1.25 per cent greatly reduces the growth and warping that occur in unalloyed irons as the result of repeated heating and cooling. Chromium cast irons in this range of chromium content may be inoculated with silicon alloys to decrease the tendency to chill and, also, to assist in maintaining machinability. Such irons are adaptable to various high-temperature applications, such as melting pots, die-casting machine parts, grate bars, etc.

How Binder Protects Chromium

For the addition of chromium to cast iron, ELECTROMET produces briquets containing exactly 2 lb. of chromium each. The alloy is protected by a refractory binder, which has a high melting point and, therefore, helps to prevent oxidation of the chromium until it is melted and delivered to the crucible of the cupola.

The recovery of chromium from "EM" briquets is thus uniformly high, normally above 85 per cent, and it is easy to obtain the desired final chromium content. This is of particular importance when the limitations of hardness and machinability for a casting demand close chemical control.

Typical Briquet-Iron Mixture

The use of "EM" chromium briquets in the production of cast iron of low chromium content is shown in the table below.

Fig. 2—"EM" chromium briquets are hexagonal in shape, and each contains exactly 2 lb. of chromium. Notched briquets (right), which are easy to break in half, can be purchased for use when 1 lb. additions of chromium are desired.

The mixture given is for a medium-strength iron used for castings in which resistance to wear or heat is required.

Booklet Available

Typical briquet mixtures for other types of irons are given in the booklet "Briquetted Alloys for the Iron Foundry Industry." This booklet also contains information about "EM" briquets of silicon, silicomanganese, and ferromanganese. If you would like a copy, free of charge, simply write to the address given above or to the ELECTROMET office nearest to you. Offices are in Birmingham, Chicago, Cleveland, Detroit, Los Angeles, New York and San Francisco. In Canada: Welland, Ontario.

The terms "EM" and "Electromet" are registered trade-marks of Union Carbide and Carbon Corporation.

Typical Briquet Mixture for Low-Chromium Iron

Base Charge			Alloys in Charge Material					
			Silicon		Manganese		Chromium	
Per Cent	Lb.	Material Charged	Per Cent	Lb.	Per Cent	Lb.	Per Cent	Lb.
20.0	200	Pig Iron	2.25	4.50	0.85	1.70	—	—
30.0	300	Return Scrap	2.00	6.00	0.75	2.25	0.57	1.71
30.0	300	Purchased Scrap	2.00	6.00	0.65	1.95	—	—
20.0	200	Steel Scrap	0.10	0.20	0.45	0.90	—	—
100.0%	1,000 lb.	Total Base Charge		16.70 lb.		6.80 lb.		1.71 lb.
Briquets Required		5 Silicon Briquets		5.00		—		—
		1 Silicomanganese		0.50		2.00		—
		2½ Chromium Briquets		—		—		5.00
		Total Alloys Charged		22.20 lb. Si or 2.22% Si		8.80 lb. Mn or 0.88% Mn		6.71 lb. Cr or 0.67% Cr
		Melting Recovery		x .90		x .85		x .85
		Final Iron Analysis		2.00% Si		0.75% Mn		0.57% Cr

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MORE STEEL
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THE iron and steel industry faces a serious scrap shortage, growing more critical every day. . . . It will be impossible for producers to make the steel tonnages demanded for rearmament and essential civilian needs, unless consumers cooperate by furnishing *more scrap*. . . Most desperately needed now is heavy industrial iron and steel scrap. . . . Keep the cobwebs from gathering at your own plant by turning in more of your own scrap today.

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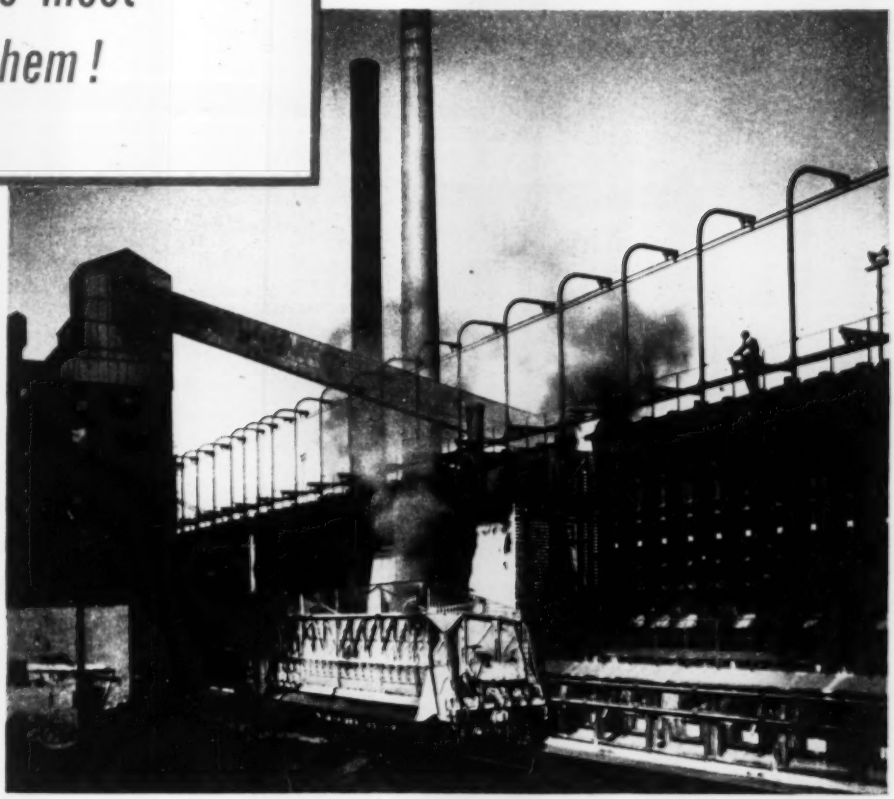
With this transportation advantage, plus the saving through mechanized mining and virtually unlimited reserves, you will find it pays to look into B&O Bituminous.

There is a highly efficient coking coal ideally suited to *your* needs. *Ask our man!*



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TECHNICAL data on drilling cast iron with twist drills tipped with Carboloy cemented carbide.

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SLIDE FILMS (at approximate print cost) for visual, in-plant carbide training.

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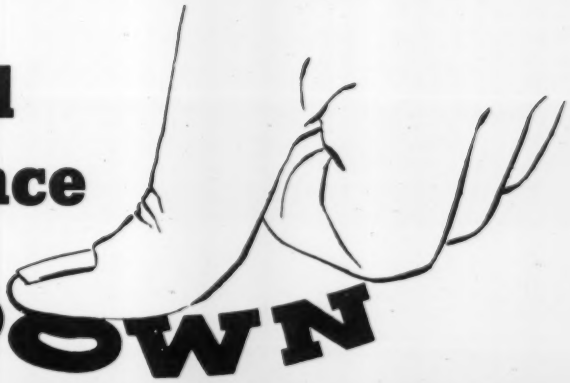
a practical tested plan for helping you get even greater benefits from the use of carbide tools in your plant

CARBOLOY D

BASIC "Triple C" Plan book, part of comprehensive Carboloy Service Program for more effective use of cemented carbides and resultant lower break-even points.

Specify **CARBOLOY®**
CEMENTED CARBIDE

...tool and maintenance costs DOWN



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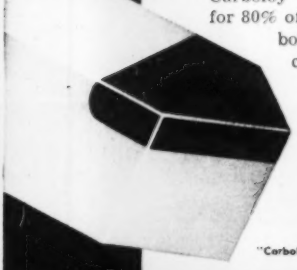

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Exclusive Carboloy Services cover everything you should know for more efficient selection, design, fabrication, use and maintenance of cemented carbide tools and dies. Services include tuition-free Customer Training School . . . free technical manuals, charts, catalogs . . . slide films (at approximate print cost) . . . and advice and assistance on your carbide problems from skilled Carboloy engineers.

Write for information, or contact your local Carboloy Sales Engineer or Authorized Distributor, today.

CARBOLOY
DEPARTMENT OF GENERAL ELECTRIC COMPANY
11141 East 8 Mile Street • Detroit 32, Michigan

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STANDARD TOOLS
THE QUALITY BRAND

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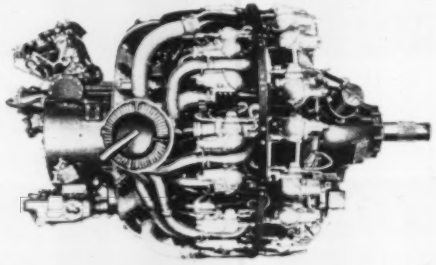

• Each new Wright 18-compound "Turbo-Cyclone" aircraft engine puts 3250 horsepower roaring into action. Helping convert that tremendous power into flashing aircraft performance is this turbine shaft, precisely machined from ENDURO Stainless Steel.

ENDURO serves the aircraft power plant designer and producer well. Free-machining ENDURO bars—both hot rolled and cold drawn—economically pair exceptional resistance to heat, abrasion and corrosion with great strength and durability.

ENDURO responds readily to forging. As this shaft indicates, it is readily machinable. Two ENDURO grades, for example, are fully 90% as machinable as Bessemer screw stock. In cold finished bar form, ENDURO provides close tolerances, accuracy of section, uniform soundness, and fine surface finish.

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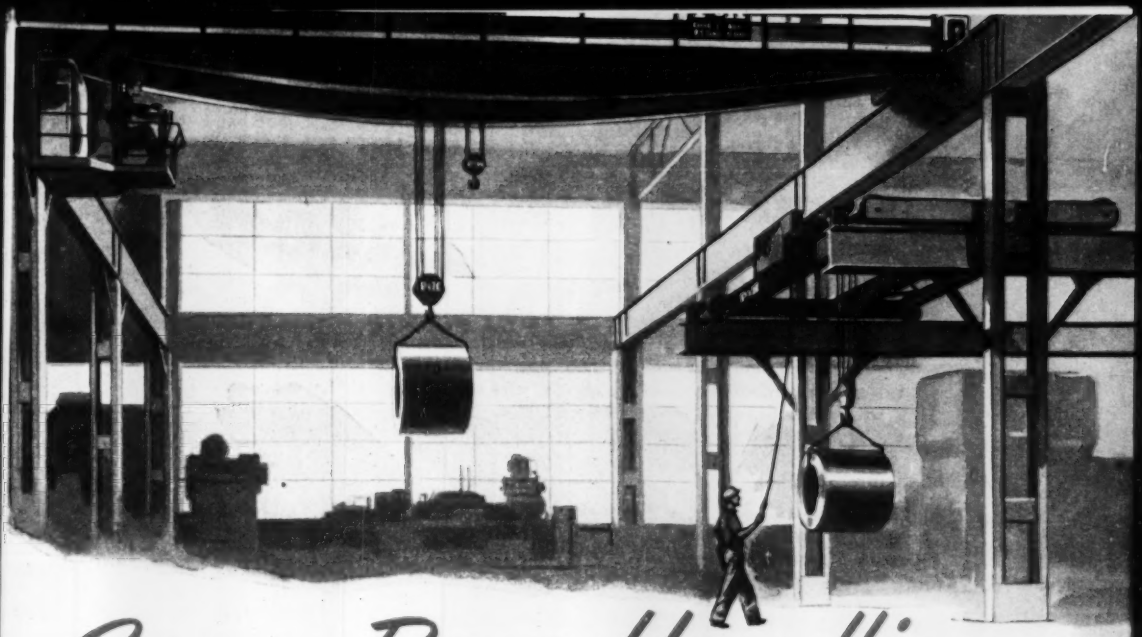

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This idea may hold real advantages for you. At transfer points, loads can be moved at right angles with heavy duty and intermittent service cranes supplementing each other. It provides faster, more flexible movement of heavy loads "thru-the-air" to meet your production requirements. It helps keep manufacturing operations at top efficiency—prevents congestion and delays.

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• A manufacturer has been using a standard roller chain for years on his machine. A Rex Field Sales Engineer showed him that he could use a Baldwin-Rex Double Pitch Roller Chain and get the same operating efficiency at a substantial reduction in cost because speeds did not require standard roller chain.

• Another manufacturer had been using conventional flat top chain to carry cans through his machine. It was necessary to pay a premium for special bevel top plates to avoid tipping of cans. By switching to Rex Table Top® he got even smoother tip-free operation at far lower cost.

• In another instance, a Rex Field Sales Engineer persuaded a manufacturer to switch from the pin-and-cotter roller chain he was using to a Baldwin-Rex Riveted Roller Chain. The change not only resulted in an initial cost saving but in longer life since the rivets have greater holding power.

• To a manufacturer of construction machinery, who had been using cast manganese steel chains, a Rex Field Sales Engineer recommended the use of Rex Steel Chabelco Chains. Since these chains are designed for efficient operation under dusty, dirty conditions, longer service life for both chains and sprockets at lower overall costs resulted.

Because Rex Field Sales Engineers have all the resources of a complete chain line at their command, they can recommend without prejudice the exact type or size of chain that will deliver the most efficient performance at the lowest cost to you and your customers. You'll find it will pay you to consult with him regarding your chain application problems. Call your nearest Field Sales Office, or write to Chain Belt Company—1660 W. Bruce Street, Milwaukee 4, Wisconsin.

Chain Belt COMPANY OF MILWAUKEE

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ALLEGHENY LUDLUM STEEL CORPORATION

Henry W. Oliver Building • Pittsburgh 22, Penna.

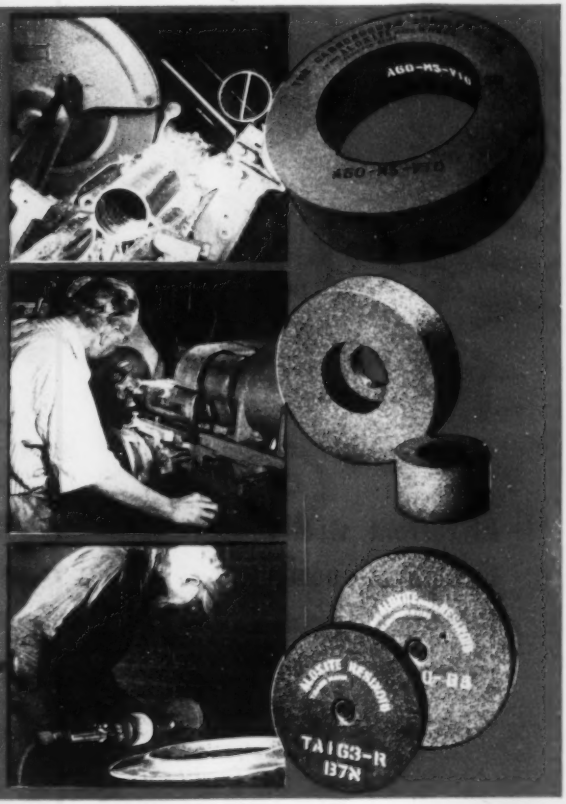
The RIGHT Abrasive gets the job done BETTER

You can be sure of using the right abrasive in every case by selection from the *complete* CARBORUNDUM line... the only complete line of abrasives manufactured under one brand name. For utmost economy in metalworking, you'll find it pays to standardize on abrasives from the *complete* CARBORUNDUM line.

● Improved V10 Bond Centerless Grinding Wheels by CARBORUNDUM are engineered to maintain grinding efficiency with minimum contact pressure. Their cool free cutting action makes them ideal for heavy stock removal on both hard and soft materials.

● Excellent form holding qualities, less wheel dressing and fewer machine adjustments during a run are outstanding features of Internal Grinding Wheels by CARBORUNDUM. Effectively applied to wide range of work; low inventory requirements.

● Bonded products by CARBORUNDUM for general purpose and weld grinding expedite a high rate of production at lowest cost. Typical example is the Type 1 Portable Grinding Wheel with *built-in* rubber bushing, which reduces wheel "bounce", lessens operator fatigue.



See Your **CARBORUNDUM** distributor... or write Dept. S 81-25.

Only CARBORUNDUM

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makes ALL Abrasive Products ...to give you the proper ONE

PLATE *and* STRIP...

Metal Hides

for WORK-HORSES and WAR-HORSES

Plate and strip mill rolling practices have come a long way since the first metal panels and trim were used for trucks and motorized armor—but as motor-makers' demands increased and specifications became more rigid Mack-Hemp Rolls were ready to take over the productioneering task.

That's because Mack-Hemp engineers and metallurgists always keep ahead of the improvements in rolling mill practice—always coordinate their development programs with the operators and rollers. As a result *the rolls with the striped red wabblers* are familiar sights in every stand, for work and back-up, wherever plate and strip are produced.

You'll find that a large part of the plate and strip rolled for use in trucks and armored vehicles—an estimated 526,000 tons in 1950—came from mills equipped with Mack-Hemp Rolls, which is another good reason why it's always worthwhile to keep an eye on what's new at Mack-Hemp.

MACKINTOSH-HEMPHILL
COMPANY

PITTSBURGH and MIDLAND, PENNSYLVANIA

Makers of the Rolls with the Striped Red Wabblers

MACKINTOSH-HEMPHILL PRODUCTS INCLUDE: Rolls . . . Steel and Special Alloy Castings . . . Completely Integrated Strip Mills . . . Heavy Duty Engine Lathes . . . Mackintosh-Hemphill Rotary Straighteners . . . Improved Johnston Patented Corrugated Cinder Pots and Slag-Handling Equipment . . . Shape Straighteners . . . End-Thrust Bearings . . . Shears . . . Levellers

assure EXTRA PRODUCTION by giving gears EXTRA PROTECTION

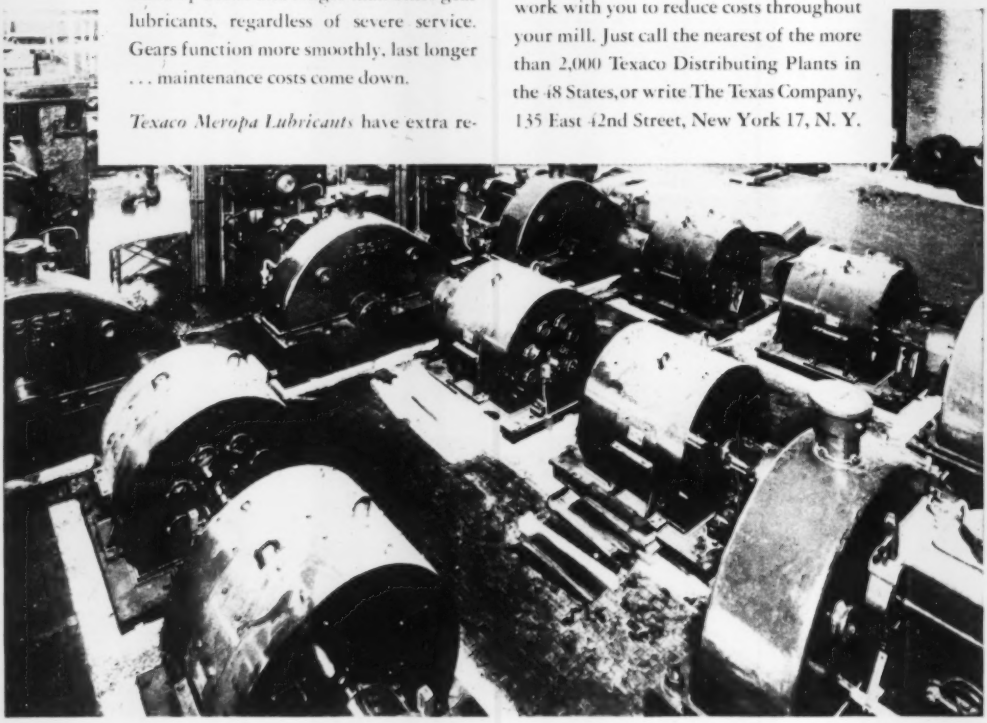
...with Texaco Meropa Lubricant

Present-day production schedules are tough on reduction gears . . . call for a lot of extras. Here's where *Texaco Meropa Lubricant* is used and preferred. Its outstanding EP (extreme pressure) properties stand up better and longer than other gear lubricants, regardless of severe service. Gears function more smoothly, last longer . . . maintenance costs come down.

Texaco Meropa Lubricants have extra resistance to oxidation and thickening. They will not foam . . . will not separate in service, storage or centrifuging . . . protect bearings from corrosion . . . assure extra savings.

For extra protection for oil film roll necks, use *Texaco Regal Oil*. This heavy-duty, turbine-grade oil resists oxidation, emulsification and sludging, keeps systems clean.

A Texaco Lubrication Engineer will gladly work with you to reduce costs throughout your mill. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.



TEXACO

TEXACO Meropa Lubricants

FOR STEEL MILL GEAR DRIVES

TUNE IN . . . TEXACO STAR THEATER starring MILTON BERLE on television every Tuesday night. METROPOLITAN OPERA broadcasts every Saturday afternoon.

The Metalworking Outlook

December 3, 1951

Defense Program Critics Take Aim

Last week Defense Mobilizer C. E. Wilson bore the brunt of some of the sharpest criticism yet leveled against the defense production program. The heaviest attacks did not come from the House-Senate "watchdog" committee which is currently holding hearings on the program, but from the Senate preparedness subcommittee which said present arms output "will not enable us to have the required strength by the target date." The Wilson rebuttal: Military production "schedules" set by the armed forces are not schedules at all, and there's no such thing as a target date. He believes defense production is going "as well as could be expected."

Wilson Rebuttal: Output Index

The Federal Reserve Board's industrial production index—which encompasses much defense output—bears out Mr. Wilson's argument. The gage was 213 in July, 217 in August, 219 in September, will probably hit 222-225 this month, 228-230 by next June and 230-232 one year from now. A year ago the index stood at 217.

Wages: Hot Political Potato

Thus far, Congressmen have had scant comment on the wage stabilization side of the defense picture, probably because that's a hot political subject and because the government may soon have an embarrassing decision to make about steel wages. Average hourly earnings of production workers in durable goods manufacturing now stand at about $1.71. They may reach $1.75-$1.80 by next June and hold at that level for the rest of the year.

Prices Edge Upward

Consumer prices are continuing a modest rise and by mid-month the Bureau of Labor Statistics' consumers' price index may reach 186.8 or 186.9, compared with 186.6 in September. Watch for a gradual rise in that index for the next 12 months. It will reach between 189.5 and 190.0 by next June and between 191.5 and 192.0 by next December.

Below the Ceiling

A scattering of below-ceiling prices now prevail, but very few in any durable goods lines. Most of the below-ceilings exist in the soft goods—hides, leather, shoes and textiles, including some men's and women's clothes. Occasional below-ceilings are reported by television set and other appliance manufacturers, but actual cutting of the ceiling prices here is not as great as generally believed. Because some below-ceilings do occur, pressure is mounting on OPS to lift its controls.

No Action Expected

Don't expect that pressure to get far, at least for the time being. One of the first jobs of the new economic stabilizer, Roger L. Putnam, will

Production Engineering News—p. 81 The Market Outlook—p. 165

be to appraise that entire situation and his decision will probably be to sit tight. President of Package Machinery Co., Springfield, Mass., Mr. Putnam is a Democrat. In 1946 he ran for lieutenant governor of Massachusetts on the same ticket with Maurice J. Tobin, now secretary of labor, who sought re-election as governor. They were defeated.

Small Business Gets Help

OPS has issued General Overriding Regulation 20, which sets up a simplified method by which small manufacturers can make Capehart adjustments in their ceilings. If your net sales don't exceed $250,000 a year, you can probably calculate an adjustment on form 106 for each of the commodities you sell on the basis of your overall business operation. If you're a larger manufacturer you must file form 100 to obtain adjustments. You must also file form 8 by Dec. 19 regardless of whether you have filed form 100. Form 8 is the form on which you report calculations under CPR 22 or 30, as well as any ceiling prices which are higher than your General Ceiling Price Regulation "freeze" prices.

The Government and Conversion Steel

The government may go into the conversion steel market. Demand for that premium priced product has slackened, but the U.S. may buy the material to keep all available steel capacity in use. Washington planners believe that course would be better than giving some price concession to steelmakers who can handle the conversion steel. The plan would be to buy the steel ingots from steel companies, have them made into the required shapes at government expense and then turn the finished shapes over to contractors working on orders received from the armed forces, Maritime Administration and other agencies.

What Industry Is Doing

Plastic-producing machine builders are diverting capacity to other lines—temporarily (p. 55) . . . Scrap from Korean battlefields won't be as great as was first thought . . . the Maritime Administration isn't getting many bidders for the salvage of sunken World War II vessels (p. 56) . . . Negotiators of U.S. Steel and USA-CIO will attempt to rewrite their entire contract (p. 57) . . . Shortage of jet engine machine tools is forcing production schedules for jet aircraft to be lowered (p. 57) . . . Prefabricated homebuilders hear America will need 14.5 million homes in the next decade (p. 59).

Straws in the Wind

CPR 98, if enforced effectively, may end the gray market in steel . . . Stocks of new cars are declining even though sales aren't setting any records . . . Procurement for the military and civilian government branches will be more closely co-ordinated; an "area of understanding" agreement signed by the Defense Department, Munitions Board and General Services Administration sets standards for purchase and use specifications, packaging and inspection . . . An early-warning system patent granted to RCA's David Sarnoff combines TV, radar and microwave relay to detect an enemy plane; it can utilize equipment already in use . . . Ferro Corp. was licensed by Horizons Titanium to manufacture titanium metal powder for applications in chemistry.

This Elwell-Parker with a 144" low-lift platform loads and unloads autoclaves.

Upkeep Cost Only $3.36 per Truck-Month!

Two Elwell-Parkers prove their dependability during 5 years of combined service on extra-rugged work

Extra-rugged is truly the word for the jobs done by the E-P trucks on this installation. For example, one of the Elwell-Parkers has carried an average of *660 tons in 24 hours—six days a week for over 28 months!* The other truck has already seen 35 months of service. During the total of 63 truck-months, the amount spent for parts and tires was $211.64. Thus the upkeep cost averaged a remarkably low $3.36 per month. Exclusive of tires, the amount was only 85¢ per month.

"We are *pleased indeed* with this equipment," reports the plant manager. The recent order of a third Elwell-Parker is further evidence of customer satisfaction.

Dependable Elwell-Parkers can cut your handling costs too, by giving years and years of steady service at minimum maintenance. Ask your near-by man for a specific recommendation. The Elwell-Parker Electric Company, 4106 St. Clair Ave., Cleveland 3, Ohio.

ELWELL-PARKER
POWER INDUSTRIAL TRUCKS
Established 1893

Steel's "Blood Bank" needs your help

In normal times, steel's winter "blood bank" of iron and steel scrap is built up during the fall. But not this year. Hungry steel mill furnaces are still on a hand-to-mouth diet of scrap—and may stay that way for a long time.

Because scrap is the *lifeblood* of today's high steel production, your help in getting in the scrap is desperately needed.

This is why: The steel industry is growing much faster than the supply of scrap. With steel capacity now rated over 100 million tons a year, about 37 million tons of purchased scrap will be needed each year. In 1950 steel furnaces consumed 30 million tons.

Unless this additional seven million tons of scrap is turned in there is danger that steel production may be cut in the months to come.

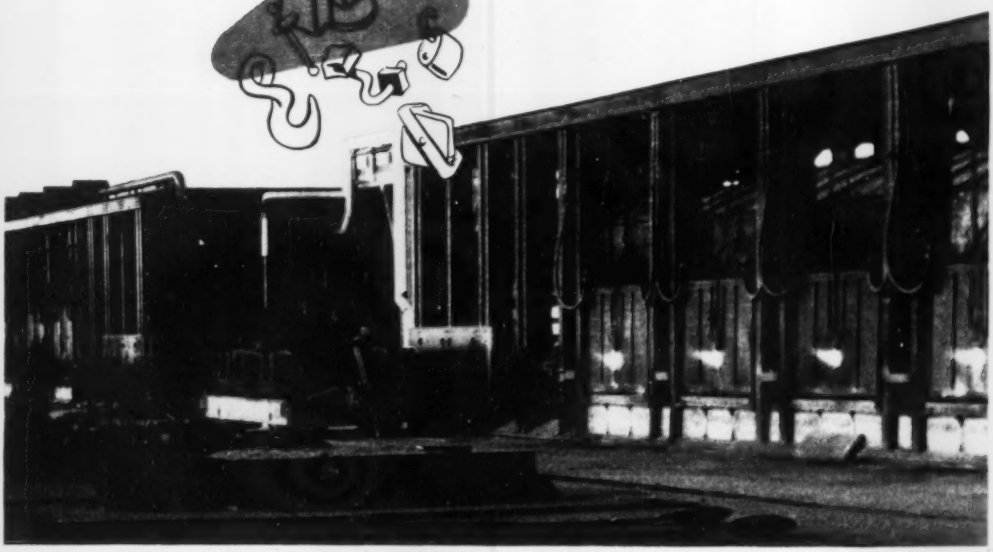
Pays in Cash Too

The price of scrap is another good reason for you to help. You get a good cash return for your iron and steel scrap by selling now.

So take these two simple steps: Survey your plant and storage yards for worn-out iron and steel parts and equipment; then call your scrap dealer. But don't stop here. Make plans now to establish a regular scrap collection program in your mill.

ARMCO STEEL CORPORATION

4771 CURTIS STREET, MIDDLETOWN, OHIO
PLANTS AND SALES OFFICES FROM COAST TO COAST
EXPORT: THE ARMCO INTERNATIONAL CORPORATION



The Right To Clean House

Recently President Truman flew from Key West to Washington to tell members of the National Woman's Democratic Club that "special interests having poured money into Ohio last year to elect a Republican senator," the Republicans "will be thinking that if money can win an election in Ohio, maybe money can win a national election." He predicted the Republicans will use the largest "slush fund ever" in the 1952 presidential campaign.

Last week the Senate Elections Subcommittee started hearings on the manner in which last year's Ohio senatorial election campaign was conducted. Administration supporters seem to think that an airing of the facts will show that one reason why Sen. Robert A. Taft won by a record-breaking majority was that the "special interests" poured a terrific amount of money into his campaign.

If these smear campaigns were mere political maneuvering in the old-fashioned sense, we would be foolish to get too excited about them. Unfortunately, in these cases the implications go far beyond the boundaries of orthodox political strategy. They strike directly at the very roots of our valuable two-party system.

In these two instances we witness the leader and his associates of the party in office deliberately accusing the opposition party of excesses in expenditures while at the same time they maliciously ignore the fact that the administration through patronage, favoritism and simple graft and corruption can throw more material support to its pet candidates than can the opposition.

The central government in Washington has become so powerful, the number of people on the federal payroll has become so large and the leverage of government bureaus upon individuals and corporations has become so oppressive that a party once in power has advantages in influencing votes far beyond anything we have ever experienced in this country. We are in grave danger that a party once entrenched in Washington can perpetuate its hold by sheer weight of power.

Eliminate abuse of that power and we reduce immediately the necessity of heavy campaign expenditures by the opposition. The right of Americans to clean their Augean stables whenever necessary must be preserved.

E. L. Shaner

EDITOR-IN-CHIEF

HITS AT GRAY MARKET: Office of Price Stabilization has issued Ceiling Price Regulation 98, effective in most instances Dec. 16, which establishes new price ceilings for warehouses, distributors, wholesalers, jobbers, dealers, merchants, brokers, consumers or others who act as intermediaries in the resale of iron and steel products. Persons who have had a chance to study the text of the long, complicated regulation in detail do not think it will

result in any drastic changes in the prices charged by warehouses and other orthodox dealers. There may be some modest rollbacks and in some cases slight increases in price.

However, if rigidly enforced, CPR 98 will seriously impair if not entirely destroy the gray market. So called "finders" who merely act as intermediaries are not permitted to add a fee to established prices. There are other restrictions which will curb unorthodox trading if the regulation is policed effectively. —p. 53

* * *

SANE SIMPLIFICATION: Last week we were somewhat facetious about an entry in a National Production Authority table showing an allotment of 7 pounds of aluminum for manufacturers of razor blades. We wondered whether it was necessary for Washington officialdom to bother itself with quarterly allotments as small as 7 pounds.

Much to our relief comes a new NPA instruction saying that in the second quarter next year small users of steel, copper and aluminum may self-certify their orders without filing applications with NPA. If the requirements of a manufacturer of Class "B" products in the second quarter of 1952 do not exceed 30 tons of carbon steel, 8 tons of alloy steel, 1500 pounds of stainless steel, 3000 pounds of copper and copper-base alloys or 2000 pounds of aluminum, he will not be required to apply to NPA for the metal.

This gratifying simplification is a step in the right direction. Why not keep up the good work by cutting red tape in other areas? —p. 53

* * *

SCRAP ESTIMATE HIGH: L. S. McCall of Columbia Steel Co., member of a four-man private industry commission sponsored by the government to survey battlefield scrap in the Far East, returns home with the definite impression that our government estimate of scrap recovery from Korea and the Pacific islands of a million tons is grossly exaggerated.

One reason is that when the Korean war broke out, the U. S. Army under orders from General MacArthur had to make up the shortage of ordnance, equipment and supplies by salvaging everything possible from the abandoned stores of World War II. A magnificent job was done in rebuilding jeeps, weapons carriers, artillery, and other items collected from isolated spots throughout the far-flung Pacific battle area.

There still is a lot of scrap in the Far East, but much of it is in places where it is difficult to recover—Formosa, Manchuria and India. —p. 56

* * *

PINCH ON FARM TOOLS: When we think of the advantages of mechanization, we usually picture an operation in a metalworking plant where production machines or materials handling equipment have been introduced to enable workers to increase their output per man hour by substantial margins. Possibly many of us are not sufficiently aware of the fact that mechanization has done miracles for the farmers of the country.

Agricultural production requirements next year will call for more farm machinery than will be available. Department of Agriculture, which is under a cloud for a sour estimate on cotton and some other blunders, says farm equipment manufacturers should be allowed to produce $2.1 billion of machinery in 1952. On the basis of allotments of steel and nonferrous metals now envisioned, actual production may not exceed $1.5 billion, which falls far short of estimated needs. This should be rechecked about six months hence. —p. 58

* * *

MORE ADHESIVES USED: Many manufacturers are unaware of the increasing importance of the role played by heat resistant adhesives in metalworking. A. J. Kearfott and C. W. Roush of General Motors Research Laboratories recently reported to the American Society of Mechanical Engineers the results of tests which show that heat-resistant, high-strength thermosetting adhesives are suitable for a wide range of applications involving not only metals but many other materials such as cork, paper etc.

Two adhesives used in the automobile industry are thermosetting, which remain unchanged after they are cured, and thermoplastic, which are rigid at low temperatures and soft and pliable at high temperatures. Both are available in tape or cement form. Tape adhesives are convenient to use but have a relatively short storage life. Only limited inventories of uncured tape adhesives should be stored and these at temperatures in the range of 40 to 60 degrees. —p. 111

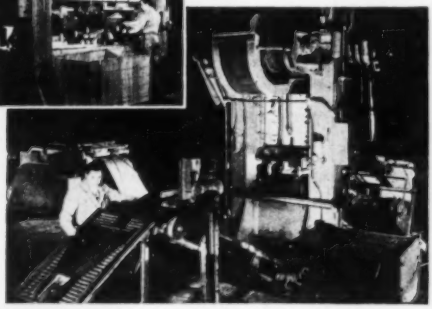
Firestone STEEL PRODUCTS SPEEDS DEFENSE SUB-CONTRACTS WITH NEW PRODUCTION LINES

Automatic Machines and Integrated Production Turn Out Large-Size Stampings in Record Time

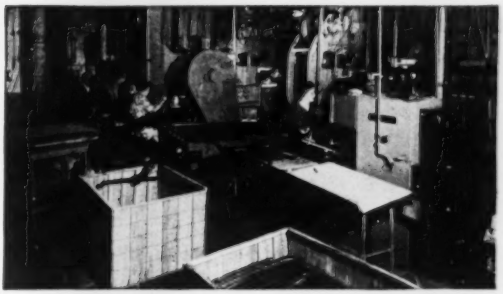
NEW automatic stamping machines are clicking out large-size stampings in record time at Firestone Steel Products, saving valuable time and money on defense sub-contracts. All production is integrated, from blanking through to painting or polishing.

Firestone's two modernized metal fabricating plants at Akron, Ohio and Wyandotte, Michigan have been completely retooled for fast, low-cost production of those heavy, large-size stampings and assemblies so vital to the speedy delivery of aircraft and ordnance equipment and accessories. If your problem is large size stampings in a hurry, wire or phone Firestone Steel Products Company, Stampings Division, Akron 1, Ohio.

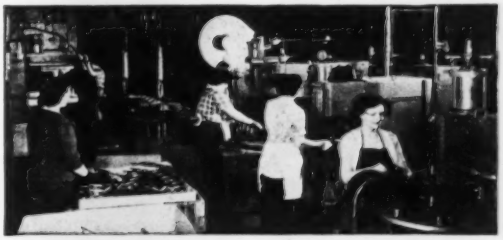
One of the huge multiple-die forming presses recently installed at Firestone for making jet engine components and parts for tanks.



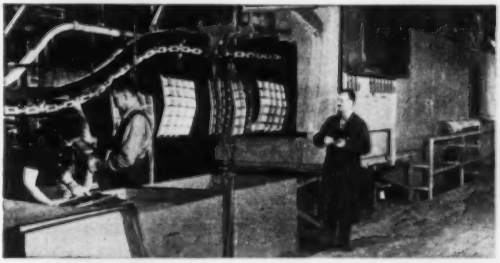
One of the new completely automatic synchronized presses producing 2600 large-size blanks per hour. Steel is fed from roll at extreme left.



Assembly operations are closely integrated with presses at Firestone, saving time and money. As many as four operations are handled at one time on new multiple-operating presses in left background.



Fast, efficient, straight-line methods save time and handling at Firestone. Parts move from presses on rollers or overhead conveyors to next operation.



Washing, bonderizing, painting, and baking are handled in a continuous automatic operation, moving entirely on conveyors from the stamping line.

Copyright, 1951, The Firestone Tire & Rubber Co.

How to Take *Chance* Out of Today's Alloy Buying

Here's a spark tester checking bars of Ryerson alloy steel. By reading the spark pattern thrown off when each bar is touched with this whirling, abrasive wheel, the tester determines the steel's analysis. In this way he verifies quality—guards against mixed steels.

Spark testing is only one of many steps in the Ryerson Certified Steel Plan for safer alloy buying—a plan especially important to you today, while restrictions are enforcing the use of leaner alloys with unfamiliar heat treatment response.

We also put every heat of Ryerson alloy steel through four separate hardenability tests, carefully recording the results on a Ryerson Alloy Certificate which goes with the steel. These tests enable you to buy Ryerson alloys on the basis of hardenability as well as analysis—the safest way to buy under today's changing conditions. And the recorded test results safely guide your heat treatment.

So play safe. Order from Ryerson where you can specify hardenability and be doubly sure. Stocks are out of balance from a size standpoint, but in all probability we can take care of your requirements.

PRINCIPAL PRODUCTS

CARBON STEEL BARS—Hot rolled and cold finished

STRUCTURALS—Channels, angles, beams, etc.

PLATES—Many types including Inland 4-Way Safety Plate

SHEETS—Hot and cold rolled, many types and coatings

TUBING—Seamless and welded, mechanical and boiler tubes

ALLOYS—Hot rolled, cold finished, heat treated

STAINLESS—Allegheny bars, plates, sheets, tubes, etc.

REINFORCING—Bars and accessories, spirals, wire mesh

BABBITT—Five grades, also Ryertex plastic bearings

MACHINERY & TOOLS—For metal fabrication

RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CINCINNATI • CLEVELAND
DETROIT • PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO

Resale Steel Prices Limited

Ceiling Price Regulation 98 will cause some modest rollbacks for steel warehouses. Effective enforcement of it would mean the end of the gray market

CEILING prices that may be charged by distributors of domestic and imported steel products are established by Ceiling Price Regulation 98, just issued by the Office of Price Stabilization.

The order may result in some modest rollbacks for steel warehouses and, with effective enforcement, would result in the elimination of the gray market in steel.

The regulation, effective Dec. 16 (Dec. 31, in a few cases), establishes ceilings for warehouses, distributors, wholesalers, jobbers, dealers, merchants, brokers, consumers or others who act as intermediaries in the resale of iron and steel products.

Pre-Korean Markups — Generally, the regulation fixes resellers' prices on the basis of the prevailing pre-Korean markups at normal levels of warehouse distribution as applied to current mill prices.

Ceilings for secondary, rejected, reconditioned and reusable products are established on the basis of their historic price relation to new products.

Ceilings on sales by holders of excess stocks are limited to cost plus a nominal handling charge. A limitation is set on the price persons other than reconditioners may pay for reconditioned pipe.

Resellers of conversion steel are required to apply to OPS for a ceiling on all sales; direct mill shipments for the account of a warehouse or reseller must be made at the same price charged by the producing mill.

A so-called "finder" who merely acts as an intermediary may not add any fee to the ceiling price established by the regulation.

Purchasers of excess stock who resell the steel without going through a warehousing operation are limited to a markup of 20 per cent over the applicable ceiling price of the holder of the excess stock.

Geographical Variance — Pricing methods used in the regulation are those customarily prevailing in the warehouse trade. Markups for some products vary according to geographic location. Other items are priced on a uniform markup; still others are sold on a mill parity basis.

Generally, ceiling prices are computed by determining average material costs during a calendar month, adding an amount calculated by applying a specified percentage markup to average material cost, and adding incoming transportation costs and extras. Specific provisions are provided for calculating each of the elements used in computing the price for each product.

Monthly Recalculation — Ceiling warehouse base prices must be recalculated each month in line with the formula set forth in the regulation and must be used in determining the ceiling price for all shipments from the 16th of the month to the 15th of the following month.

For example: Costs from Nov. 1 to Nov. 30 are used to determine the ceiling warehouse base price for all shipments during the period Dec. 16-Jan. 15, and correspondingly costs from Dec. 1 to Dec. 31 should be used in determining the ceiling warehouse base price for all shipments during the period Jan. 16 to Feb. 16.

Dollar and cents markups are determined by multiplying monthly average material costs by the established applicable ceiling percentage markup. Established ceiling percentage markups for each product according to the area in which the warehouse from which the product is shipped to the purchaser is located are shown in the accompanying table.

Certify Yourself—Within Limits

Beginning the second quarter of 1952, small users of controlled materials (steel, copper and aluminum) will be able to self-certify their orders without filing an application with NPA.

NPA instructions state that manufacturers of Class "B" products will not be required to apply for their metals if their total requirements during the second quarter will not exceed the following amounts: Carbon steel—30 tons; alloy steel—8 tons; stainless steel—1500 pounds; copper and copper-base alloys—3000 pounds and aluminum—2000 pounds. Direction 1 to CMP Regulation 1 is being amended to permit such manufacturers to self-certify their orders up to the listed limits. This will relieve some additional 15,000 small users of controlled materials from the necessity of filing applications.

A considerable number of other manufacturers of "B" products are expected to receive written instructions to file their applications for second quarter 1952 allotments with NPA field offices. The same criteria will be used in field offices as in Washington but it is hoped that manufacturers will be notified of their authorizations more promptly.

DPA Revises Claimants' Needs

Production and construction allotments of steel, copper and aluminum to some claimant agencies have been boosted by Defense Production Administration.

Additional amounts of controlled materials will go to: Federal Security Agency (for construction of schools and hospitals); Atomic Energy Commission (for unnamed projects); Defense Electric Power Administration (for transmission lines); and Defense Department (for urgent production programs).

Minor adjustments also were made

Percentage Markups Allowed Resellers

Product	Metropolitan New York	California	Texas	Oregon, Washington	All others
	Per cent	Per cent	Per cent	Per cent	Per cent
Standard structural shapes	55	47W	56	51	52
Junior channels	55	60	56	51	52
Junior beams	55	60	56	51	52
Wide flange beams	57	47W	65	51	52
Hot rolled carbon bars, bar shapes	52	41W	56	50	45
Hot rolled carbon plates	53	46W	53	52	50
Floor plates	47	56	44	50	43
Abrasion resisting—All products	64	60	60	64	60
Hot rolled carbon sheets	56	46W	57	52	51
Hot rolled carbon strip	59	50W	63	56	54
Cold rolled sheets	46	47W	43	46	43
Enameling sheets	52	52	52	52	52
Cold rolled strip—low carbon	48	48W	48	48	48
High tensile low alloy—All products	48	50	48	50	48
Cold finished carbon bars	36	31W	39	46	33
Reinforcing bars unfabricated	52	41W	56	50	45
Tin plate, black plate, short ternes	45	45	45	45	45

W—Markup determined by applying established percentage markup to the average mill base price from West Coast producers.

CAPACITY BOOSTER: The first heat of steel from a new 250-ton open-hearth furnace is tapped at the Steelton, Pa., plant of Bethlehem Steel Co. The new furnace, which has an annual capacity of 180,000 tons, is part of an improvement program which is expected to boost the annual ingot capacity of the plant to 1,312,000 tons by the end of 1952

to allow more materials for such programs as civil defense, and electrical, metalworking and mining equipment. The additional materials were allotted from the DPA reserve set aside when original first quarter allotments were made.

NPA Acts To Aid Steel Expansion

In a move to take some of the major bottlenecks out of the iron and steel expansion program, the NPA has transferred a number of items of blast furnace and steel works equipment to the A Products list, effective with the second quarter of 1952. By this change, the steel companies will obtain allotments of steel for this equipment and hand on the CMP tickets to the firms who are to build it. The switch affects only new equipment; there is no change in the setup governing MRO requirements.

Equipment now in the A Products list comprises: Slab and billet heating furnaces; blast furnace tuyeres, bosh plates, stack coolers, stove valve seats, ladle cars and slag thimbles; open-hearth steel ladles, slag thimbles and charging boxes; and electric furnace charging buckets.

There is a possibility that some other items of steel mill equipment, notably cranes, may be switched to the A Products list.

CMP Questionnaire Ready 'Soon'

Still held up pending a review by all the interested government departments and agencies is the NPA questionnaire form on which steel, copper and aluminum consumers who have been unable to place their first quarter allotments in full may apply for NPA assistance.

Informed authorities say the form will be available "soon" both at NPA headquarters in Washington and at regional ofices; but it seems apparent that unless they are ready without further delay there will be little time in which to devise relief for the many hardship cases.

Blast Furnaces Set Record

A monthly production record for blast furnace production in the United States was set in October.

Output that month was 6,197,176 net tons, the American Iron & Steel Institute reports. That sum was composed of 6,132,051 tons of pig iron and 65,125 tons of ferromanganese and spiegeleisen.

Previous record production was marked up in May when blast furnace output totaled 6,173,360 tons. To attain the new record in October, the stacks were operated at the highest rate of this year, 100.6 per cent of capacity.

Blast furnace output in the first ten months of this year totaled 59,344,068 net tons, compared with 54,404,297 tons in the like period of last year. Additional comparisons (in net tons) are in table below:

1951	Pig Iron	Ferromanganese and Spiegel	Total Blast Furnace Output
September	5,827,269	62,833	5,890,102
9 mos.	52,599,762	547,130	53,146,892
October	6,132,051	65,125	6,197,176
10 mos.	58,731,813	612,255	59,344,068
1950			
October	5,861,913	62,514	5,924,427
10 mos.	53,850,996	553,301	54,404,297

Steel Reference Work Ready

Up-to-date version of U. S. Steel Co.'s famous reference work "The Making, Shaping and Treating of Steel," is now available as the sixth edition. Scientific advances in the steel industry during the last ten eventful years are covered fully. In addition, description of standard processes have been revised or rewritten to bring them up to date. Experts and authorities in each steelmaking field were marshalled to prepare the latest edition, which contains 1435 pages, 713 illustrations and 23,000 listings.

Under preparation for more than two years, the book describes technological progress in the last decade, changes that involve not only new conceptions of steel as a material but also practical ways of applying it successfully to the complex uses of man. Published on a non-profit basis, the book is priced at $7.50, and can be ordered from U. S. Steel Co., Pittsburgh 30.

New Type Plate Saves Tin

Savings up to 50 per cent of war-essential scarce tin are being made possible by development of "differential coated electrolytic tin plate."

In this new method of tin plating, developed by Weirton Steel Co., Weirton, W. Va., different coating weights of tin are deposited electrolytically on either side of the steel strip rather than equally on both sides as heretofore. Thus, the inside tin coating is sufficient to withstand the corrosive attack of the packed product and the outside coating is adequate to pass the rigors of processing and atmospheric conditions.

Mr. J. J. Munns, vice president, Weirton Steel Co., told the Cleveland Regional Technical Meeting of the American Iron & Steel Institute that more than 200,000 base boxes of the new type tin plate had been produced and shipped up to Nov. 1.

Freight Car Allotments Pared

Railroad car builders will have to pull 3000 freight cars out of their hats to reach NPA's first quarter 1952 goal of 24,200 cars.

While authorizing 24,200 cars, the NPA will allot controlled materials on the basis of 21,200 cars. Allocations will be made as follows: Twenty-five hundred tank cars authorized, material granted for 2000; 20,500 domestic freight cars authorized, material granted for 18,000; 1200 export cars authorized, and material granted for 1200.

Plastics Machinery: Partial Eclipse

Demand is off because plastic output lags, but most equipment makers have diverse operations and can switch to other, metalworking lines

MANY MAKERS of plastics-producing machinery are diverting at least part of their capacity to other lines—temporarily.

At the moment the need for plastics equipment is not great, but most manufacturers also turn out metalworking machinery—in heavy demand—to which they can devote more attention. Plastics production is currently in the doldrums because it's basically for civilian buyers, notably television set and refrigerator manufacturers whose operations have been sharply curtailed.

The Situation—The 1951 output of plastics machinery—molds, preforming equipment, presses and extruders—will be only half of what it was in 1950. That's because in the first part of this year molding materials were allocated, and plastics producers didn't need much machinery. When the materials were decontrolled, demand for plastics dropped and consequently no pickup in requirements for plastics machinery occurred.

Most of the 300-odd companies that make plastics machinery and all the tool and die shops that can produce molds originally started out making metalworking machinery or equipment and only got into the plastics machinery business since the rise of plastics production in the last decade or two. Thus, those companies are discovering their flexibility a godsend now.

Case in Point—A typical company that finds diversification pays off is Hydraulic Press Mfg. Co., Mt. Gilead, O., manufacturer of metalworking presses, plastic molding presses, die casting machines, pumps and other products. Normally HPM devotes 25 per cent of its capacity to plastics machinery. In 1950, a boom year in plastics, half its operations were turned over to that type of equipment. Now only 10 or 15 per cent of its order backlog consists of commitments for plastics machinery. During World II a similar pattern evolved. Fellows Gear Sharper Co., Springfield, Vt., maker of plastic injection molding equipment and machine tools, is another firm that for the time being is concentrating more on metalworking products. Many of the machine tool builders who were also in plastics have almost dropped that end of their business temporarily.

The outlook for plastics machinery makers is not all dark. Refrigerator manufacturers think they can boost production in 1952, provided they can make more parts out of plastic. Refrigerator tooling is now going on, and plastics machinery makers see new markets for their equipment because many 1952 refrigerator models will have inner door liners, freeze chest doors, humidifier drawers and other components of plastic rather than metal. Plastics may also find greater uses in military applications, particularly as alternates for aluminum.

Tool and Die Makers Agree

Tool and die makers agree on one thing: They've got a pricing problem.

The industry generally is pricing under the General Ceiling Price Regulation pending mandatory application of Ceiling Price Regulation 30 (Machinery) on Dec. 19. The Tool and Die Industry Advisory Committee in a meeting with OPS officials stated that their industry for the most part has found it utterly impractical to price under CPR 30.

The main difficulty is that only 3 to 15 per cent of the cost of tools and dies is represented by materials costs and that a varied list of materials are required for each job. Members of the committee said the accounting facilities of most producers are such as to make it impossible to check material cost increases against base period prices on each job they do.

No pricing system now in effect pleases all of the tool and die makers.

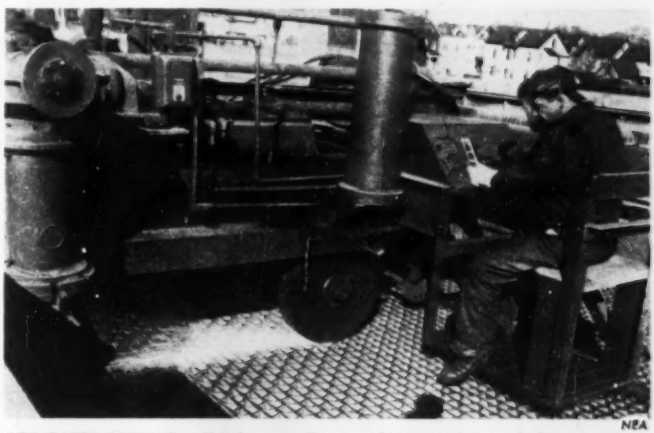
Search Schools For Tools

The current canvass of schools and state and federally-financed institutions will uncover well over 5000 and possibly as many as 25,000 used machine tools for the defense production effort, NPA officials estimate. These institutions are being asked to report the tools in their shops and laboratories for which they have no need. The first group of colleges to report, including University of Massachusetts, Massachusetts Institute of Technology, Concordia College, University of Kentucky and University of Washington, turned in a total of approximately 200. The tools are being purchased by defense contractors as fast as they are offered. NPA cautions the institutions against offering tools for which there is use in current educational programs.

Tax Writeoffs Granted

Certificates of necessity for accelerated tax amortization of 186 new or expanded defense facilities were approved by the DPA from Nov. 6 to Nov. 16.

Applicants for production of ma-



NEA

FOR SAFER DRIVING: This large milling machine grinds non-skid grooves into the steel grid of a roadway near Boston right on location. Formerly the grid had to be taken up and sent to the factory in sections to have the grooves milled. Six, 24-inch blades compose the working end of the milling machine made by Reliance Steel Products Co. of McKeesport, Pa.

chine tools, a total of 44, received certificates for $12,765,616. The largest certificate in this category, totaling $5,411,082 of which 65 per cent is allowed for fast writeoff, was given to Gleason Works, Rochester, N. Y.

How Much Korean Scrap?

One member of the investigating commission says high estimates are pipe dreams

THE AMOUNT of recoverable scrap in Korea has been greatly overestimated.

So says L. S. McCall, assistant director of purchases for Columbia Steel Co., San Francisco, a subsidiary of U. S. Steel Corp. He spoke at the Pacific Coast Conference of the Institute of Scrap Iron & Steel.

Wish Father to the Thought—As a member of a four-man private industry commission sponsored by the government to survey battlefield scrap, Mr. McCall says the mission's "observations afforded convincing proof that some of the high estimates of scrap recovery for American steel mills are strictly pipe dreams." Estimates on scrap recovery from Korea and Pacific islands have been placed as high as 1 million tons.

Mr. McCall believes that one reason why the scrap potential in Korea will be disappointingly low is that the government is "doing a tremendous job of rebuilding shot-up equipment."

High Elsewhere—Although the Korean potential is less than expected, he points out that "India possibly has one of the largest scrap stockpiles in existence." Okinawa also has a lot of scrap. The material in Formosa "is being tightly held by the Chinese nationalists."

"Our study reveals there is a four to five-month inventory of steel scrap presently stockpiled at the Japanese steel mills," Mr. McCall reports. "We also learned that sufficient tonnages of scrap have been contracted by Japanese mills to carry them for an additional 12 months."

Seeing the Scrap Shortage

Seeing is believing.

One hundred manufacturers and businessmen saw what happens to steel scrap at an open-hearth furnace when United States Steel invited them to visit its Homestead Works at Pittsburgh. They learned that the district steel mills have on hand only a three-day supply of the vital raw material.

It is estimated that an additional 7 million tons of steel scrap are required immediately if full production is to be maintained throughout the winter months when scrap collections normally fall off because of bad weather.

Mr. R. L. Van Cleve, U. S. Steel's assistant vice president in charge of purchases, said that battlefield scrap and sunken vessels can contribute only a small portion of the needed scrap. "The problem is primarily our domestic problem and that is why so much effort is required to increase the flow of this necessary raw material from within our own country."

THE PHILIP R. CLARKE HITS THE WATER AT LORAIN, O.
. . . she'll join the Pittsburgh fleet for 1952 shipping season

Bids Meager for Sunken Ships

The Maritime Administration's difficulty in finding firms interested in salvaging sunken vessels of World War II and their cargoes again was emphasized Nov. 27 when two companies submitted bids which at first glance did not strike the MA as unduly liberal.

Atlantic-Pacific Ship Raising & Salvaging Co., Los Angeles, offered to salvage 11 sunken ships for 89 per cent of the net proceeds from the sale of the hulls and such government-owned cargoes as are recovered. Logan Diving & Salvage Co., Jacksonville, Fla., the only other bidder, offered to salvage the 11 vessels for 96.5 per cent of the net proceeds. But these bids are better than those opened on three sunken vessels in September when one firm offered to pay the MA $100 per ship in return for title to hulls and cargoes, and a second firm bid $7 on one of the ships on the same basis. The commission threw out the bids received in September. What it will do with the bids received Nov. 27 on 11 vessels remains to be determined.

Altogether, the MA has approximately 125 sunken ships of which some 60-odd offer a reasonable chance of recovery. The iron and steel scrap potentiality is about 3500 net tons per vessel, or a total of around 225,000 in the 60-odd. The cargoes in these sunken vessels include substantial quantities of such critical items as molybdenum ore, manganese ore, iron ore, copper, tin and zinc.

New Lake Carriers Launched

Two large lake carriers slid down the ways and hit the water within forty-eight hours of each other last week.

Pittsburgh Steamship Co.'s new 647-foot iron ore carrier, the *Philip R. Clarke*, was launched last Monday at Lorain, O. Built by American Ship Building Co., the vessel has an iron ore carrying capacity of 19,600 gross tons and will join the Pittsburgh fleet for the 1952 lake shipping season. Two sister ships of the *Clarke* are currently building and will join the fleet next summer.

The *Clarke* went down the ways two days ahead of another new U. S. Steel vessel, the *John G. Munson*. This 666-foot self-unloading limestone carrier was built at the Manitowoc, Wis., yards of the Manitowoc Shipbuilding Co. The *Munson* will carry 20,000 gross tons of stone at 16 miles an hour and will join the Bradley Transportation Co. fleet during the 1952 season also.

Down to Brass Tacks

Preliminaries behind them, U.S. Steel and the union really get down to cases this week

REPRESENTATIVES from the United Steelworkers of America-CIO and U. S. Steel Corp. really begin their negotiations this week although the parleys officially started Nov. 27.

Preliminaries are about over, the 80 participants from both sides that started on the affair have been whittled down to a handful and this week may be revealed the dollars-and-cents demands USA President Philip Murray has in mind.

Big Job—Yet the negotiators will talk over many matters besides pay rates. They'll attempt to rewrite the entire steel contract of April, 1947, which has only been amended since then. Among the many matters to be taken up until Dec. 31 when the contract expires will be vacations, shift premiums, overtime rates, incentive plans, seniority, grievance procedures, safety and health and geographical differentials.

An issue that will be handled gingerly is the matter of the guaranteed annual wage. Even some business men are now recommending a reappraisal of industry's stand on that matter, including E. H. MacNiece, director of quality control for Johnson & Johnson, New Brunswick, N. J. He made such a recommendation before the American Society of Mechanical Engineers in Atlantic City.

Wait and See—Other steel companies are also meeting with USA locals, but they're expected to mark time until U. S. Steel concludes negotiations if the corporation concludes them. Sentiment is stronger than ever that the whole issue will end up in Washington.

The USA is also negotiating with Aluminum Co. of Ameria and is making much the same demands as to U. S. Steel. The parley opened last week, but is now in recess until Dec. 11.

WSB Sets Incentive Rules

Wage Stabilization Board will approve new incentive wage plans which meet WSB standards.

The policy was approved by WSB public and industry members over the dissent of labor members. Labor unions don't like incentive plans generally because they fear they lead to a "speedup." The board which already has provided a procedure for adjusting existing incentive wage plans, has about 100 new ones awaiting approval. They'll win an o.k. if they meet seven standards, including: There shall be no increase in unit labor cost unless it can be shown that the anticipated new level of earnings will not be unstabilizing and will not create intra-plant inequities; the incentive must provide at least a 15 per cent increase in the daily or hourly pay rate, with minimum wage guarantees.

Salary Order Out

The Salary Stabilization Board's General Salary Order No. 6 establishes a formula to enable employers to eliminate inter-plant inequities and to maintain historical relationships between salaried employees under its jurisdiction and wage earners under the jurisdiction of WSB.

The formula is designed particularly to permit the restoration of pay differentials between foremen and supervisors and the employees supervised by them. The new rule was really necessitated by WSB's action granting some increases to hourly employees.

Generally, the amount available for distribution is computed this way: Obtain the gross percentage of certain types of increases in base compensation granted to WSB-controlled employees and, similarly, that granted to SSB-controlled employees; subtract the gross percentage figured on the salaried employees from that on the wage earners; apply that difference in percentage to the base compensation of the salaried employees for the current payroll period.

End of Set-Off Clause Urged

Small Defense Plants Administrator Telford Taylor has announced the first important step to be taken by his new agency.

He recommends to prime contractors that they eliminate the set-off clause in subcontracts. The set-off gives prime contractors the power to withhold payments on subcontracts as a means of recovering debts or claims due from the subcontractor on other accounts. Banks are reluctant to lend money to subcontractors with set-off clauses in their subcontracts.

STEEL IMPROVEMENT & FORGE CO. . . . *inspecting forged jet-engine blades*

Aircraft Goals Lowered

Production schedules for jet aircraft have had to be lowered despite all the government planning. Reason: Shortages of jet engine machine tools and other materials.

At the same time, Chrysler Corp. has a certificate for fast amortization of 65 per cent of $5,847,656 for facilities to produce aircraft parts at its Los Angeles plant, and International Silver Co., Wallingford, Conn., has a certificate for a fast writeoff of 65 per cent of $1.7 million for facilities for making aircraft parts.

Harold Boyer, chairman of the DPA's aircraft production board, says aircraft delivery goals will rise in the next two years to four times the present rate, or about 1800 to 2000 a month.

Slab Heaters for Strip Mill

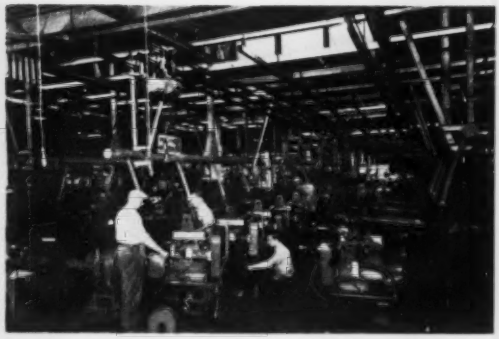
Two slab heating furnaces will be constructed for Pittsburgh Steel Co.'s new 66-inch hot strip mill at Allenport, Pa., by Rust Furnace Co., Pittsburgh.

Forging Capacity Boosted

Turbojet engine blades and buckets will soon flow at a much faster rate from Steel Improvement & Forge Co., Cleveland. It has doubled its present capacity to produce these vitally-needed aircraft engine parts by buying the adjacent plant of American Stamping Co. Steel Improvement estimates deliveries of forged parts now range from six to eight months.

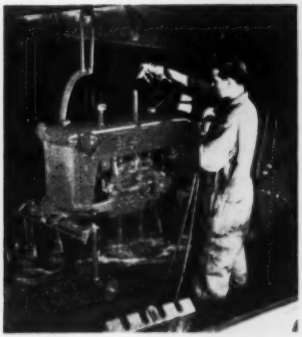
The firm is building a new plant near Toronto, Ont.

The Cleveland plant is also turning out forgings used in jet plane landing struts, jet engine fuel injection nozzles, ring and window forgings for jet engine combustion chambers, catapult hooks and wing support parts. Most of the aircraft forgings are of alloy or stainless steels, or high-temperature resisting alloys. Steel Improvement has also forged titanium successfully.



ALLIS-CHALMERS MFG. CO.
. . . testing WD tractor engines

DEARBORN MOTORS
. . . chassis on conveyor



INTERNATIONAL HARVESTER
. . . stop at the spray station

Long Row To Hoe in Farm Equipment

Because of materials shortages, especially steel, farm implement makers will turn out only $1.5 billion worth of goods in 1952 compared with $1.8 billion in 1951

FROM PLOWSHARES to swords.

That's the situation facing farm machinery manufacturers. The defense program which cuts down the supplies of steel, copper, aluminum and other materials is forcing curtailment in production of agricultural equipment—at just the time when more farm produce is needed.

Slipping — Because of materials shortages, farm machinery production dropped in the second half of this year and total 1951 output will be around $1.8 billion, equal to the 1949 levels but below the 1950 performance. The Department of Agriculture says farm equipment makers should be allowed to produce about $2.1 billion worth of machinery in 1952 to help the nation turn out sufficient foodstuffs. The equipment makers won't reach that goal. To do so, they would need 750,000 tons of steel each quarter in 1952. For the first three months they have been allotted 544,000 tons, and a number of manufacturers are unable to cash their CMP tickets in full, as was the case in the fourth quarter. Copper and aluminum are in even shorter supply, may further reduce output.

The outlook now is that 1952 production of farm equipment will decline 20 per cent from the base period for the industry—the 12 months ended June 30, 1950. That means output will slide to $1.5 billion or less, compared with $2.1 billion that the Department of Agriculture wants. The department says we need a 14 per cent increase in food production over the same base. All predictions—both on crop totals and equipment needs—would go out the window in case of allout war.

Optimists—Farm equipment makers can't see any saturation of the machinery market or any stop in farm mechanization. A drop in the number of farm workers, fairly high earning power, the need for more crops and foreign demand both for agricultural products and implements should keep the demand high.

Increased mechanization of farms and use of larger and more efficient farm machinery is the only avenue open to greater agricultural production in the face of restricted manpower. Farm employment has shrunk about 1,250,000 in the last five years, with more than one-third of that occurring in the last 12 months. Directly related to that labor loss: In the last ten years average age of farmers increased from 48 to 56.

A Matter of Money—Net realized income of farm operators is now estimated at only about $15 billion for 1951. That is better than the $12.8 billion realized in 1950 but still well below the $17 billion net income of 1947 and $15.8 billion in 1948. Besides, prices paid by farmers for goods are running about 13 per cent above prices paid for the same things and services in 1947 and 7 per cent above 1948. Farm machinery prices are 10 per cent higher now than in 1950, probably will go up more in 1952.

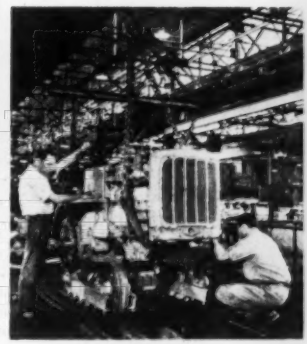
Prices of farm products in 1951 have remained about the same as those of 1950 and are expected to hold at that level in 1952. Agricultural quotations now average about 100 per cent of parity, and the sentiment is growing, even among farmers, that the whole parity system should be scrapped. The Department of Agriculture has come up with schemes to take the place of parities if those are discarded. One would have the government buy land and resell it to farmers whose present plots are too small to operate profitably. If that ever comes about, it would boost the demand for farm machinery for the larger plots.

A Problem of Production — The 1951 output of crops and livestock will be the largest in U. S. history, despite manpower losses. Machinery accounts for the gain, and machinery will have to bare the brunt of the load in 1952, because the government is certain to ask for bigger crops next year. Federal farm officials, who will announce 1952 production guides in mid-December, base their predictions on the growing population, higher per capita food consumption and rising exports.

The 1952 population will be more than 155 million, compared with 151 million in 1950. Per capita food consumption is expected to continue at the present high level, 11 per cent

IRONICALLY, now that the need for more mechanization on farms is greater (farm employment has shrunk 1,250,000 in the last five years), the outlook for production is bleak. In 1952 output of farm equipment will decline 20 per cent from the base period for the industry, the 12 months ended June 30, 1950

FERGUSON TRACTORS
. . . final assembly line



CATERPILLAR
. . . D4 diesel on the line

DEERE & CO.
. . . assembling cornpickers

above prewar. Exports of food, now taking 14 per cent of U. S. distribution, compared with 12 per cent last year, could show further increases in 1952.

Double-Edged — That foreign demand for American food helps bolster demand for equipment, but direct foreign demand for U. S. equipment is also higher; some producers call it "fantastic." Australia, India, Turkey and South American and African nations are now foremost in buying, having replaced Western European countries, the biggest purchasers of our equipment a few years ago.

Both foreign and domestic requirements for farm machinery spare parts are likewise prodigious; in 1952 they will probably be 20 per cent above the 1949 needs. NPA is now investigating the need for an order that will provide independent wholesalers, farm co-operatives and mail order houses with priority ratings for repair and replacement parts. Such an order, WPB's P-153, existed during World War II. At present, manufacturers are able to buy replacement parts, using priority rating to get delivery. The parts then can be passed along to dealers. The procedure is denied an independent wholesaler, co-op or mail order house.

In Addition—Besides farm machinery and spare parts, farmers are faced with several other shortages that may impede their attainment of 1952 food goals. Those include pesticides, barbed wire and woven wire fencing, metal roofing and side, standard pipe, trucks, tires, processing facilities and containers.

But the major farm problem in this plowshare-to-sword economy is the the shortage of new agricultural implements. Even though equipment makers are increasing their purchases of high-priced conversion steel, even though they are using every alternate material they can find, the scarcity of steel—and copper and aluminum—will keep production down, at least until mid-1952.

Oliver President Speaks on CMP

A. King McCord, president of Oliver Corp., believes that as the kinks are worked out of CMP manufacturers may be able to get all the copper, steel and aluminum that is allotted to them—something they cannot do today.

The president of the big farm machinery manufacturer said on a San Francisco visit that his company may be able to report bigger sales in its fiscal year ending October 31, 1952, than the $119,000,000 for the fiscal year just ended, despite a production loss due to the limitations on steel used during the current quarter and the three months ended March 31, 1952.

"There will be a liquidation of inventories carried over from 1951, plus, in the case of Oliver, greater production on war contracts," he explained.

U.S. Housing Needs: 14.5 Million Homes in Decade

AMERICA will need about 14.5 million homes in the next decade, says Dr. Richard U. Ratcliff, former director of housing research for the Housing & Home Finance Agency.

He made that estimate at a meeting of the Prefabricated Home Manufacturers' Institute.

Replacement—Dr. Ratcliff, now a professor at the University of Wisconsin, explains that an average of 700,000 new dwellings must be built annually to house new families and replace units destroyed by fire and disaster. An additional 750,000 homes will be needed each year to replace temporary and substandard housing.

Material shortages and credit controls will limit housing production in 1952 and probably 1953, but he predicts a large amount will be permitted for military and defense workers. He conservatively estimates the combined needs for those two groups to be 400,000 houses a year for two years. Dr. Ratcliff points out that that volume would represent nearly half the housing goal for 1952, which the HHFA administrator has said is still in the 800,000 to 900,000 range. The Wisconsin professor doubts that nearly that much emergency housing would actually be accomplished each year for 1952 and 1953.

Optimistic—In the long run, Dr. Ratcliff is optimistic that a "big bite" can be taken into the replacement market of 7 million or more houses during the next decade.

In speaking about prefabrication, he says: "There is no apparent reason why the inherent advantages of prefabrication cannot lead the industry to a position of dominance in home building—in ten years to the production of half the homes built; in 20 years to two-thirds of the homes built."

RFC Approves Loans

Five loans under the Defense Production Act took 80.4 per cent of the total amount approved by the Reconstruction Finance Corporation during the week of Nov. 8 to Nov. 14.

RFC approved 70 loans totaling $4,112,508 during that week. The five defense loans totaled $3,306,619. Companies approved for loans were N.R.K. Mfg. & Engineering Co., Chicago; Ben Pearson Inc., Pine Bluff, Ark.; Shea Chemical Corp., West Chelmsford, Mass.; Sierra Engineering Co. Inc., Sierra Madre, Calif., and C.B.S. Steel & Forge Co., Los Angeles.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor*

NPA must limit representation at industry conventions because travel appropriations were slashed but will supply speakers whenever requested

IF YOUR industry group wants a National Production Authority speaker at your convention it can have him. That's the word from the NPA spot which has control over speeches—the Public Liaison Division of the Office of Public Information.

Yet, there has to be a more careful check on expenditures for travel this year, says NPA, because Congress cut the appropriation for that purpose. But travel can be held within limits by scheduling, just one speaker, rather than several, per convention. Even so, more than one speaker per convention is allowed when circumstances seem to justify—as when one man is invited to make a principal address and another is necessary to participate in a panel.

Rationed—Says a Public Liaison Division spokesman: "All we want to do is prevent dissipation of funds through needless travel: if one man can do the job, a larger number is unnecessary."

This does not mean that NPA is pulling in its horns. "On the contrary," says NPA, "we frequently take the initiative in sending a speaker to a group that should be informed about NPA procedure and policy." Reports that numerous NPA speaking engagements have been canceled are in error; there has been only one such cancellation and that was in a case where two men were invited inadvertently when, the industry people themselves agreed, only one was needed.

NPA SPEAKERS STILL AVAILABLE
. . . not a group, if one will do

Tractor Test Data Ready . . .

Tractor manufacturers now can obtain from the Tillage Machinery Laboratory, United States Department of Agriculture, Auburn, Ala., results of recent tests with their machines. Among other things, the tests showed that the standard 13-inch width tractor rim provides just as much pulling power for tractors operating in dry sand as do wider rims. When using tractor tires with button-type and bar-type tread-on 12, 14, 16 and 18-inch rims, no gain in drawbar pull or traction efficiency was obtained with the wider rims. The tests now are being continued on soil types other than sand. (For a story on how farm equipment makers are faring, see p. 56.)

Patent Policy on Pan . . .

Responding to widespread criticism, particularly from the National Inventors' Council, that our present national attitude toward inventors discourages their maximum contribution to weapons development, the Department of Defense has created a new Patent Policy Review Board. Chairman is Rear Adm. C. M. Bolster, chief of naval research. Other members are Maj. Gen. E. M. Brannon, judge advocate general of the Army, and Maj. Gen. R. C. Harman, judge advocate general of the Air Force. The committee is to review all phases of patent policy. It particularly invites comments, criticisms and suggestions from "individuals, corporations, associations and other organizations." These should be sent prior to Jan. 15, 1952, addressed to Chairman of the Patent Policy Review Board, Office of Naval Research, Department of the Navy, Washington 25.

Acceptable Exception . . .

Varying from its custom of denying requests for larger allotments of steel, copper and aluminum than presently made under the Controlled Materials Plan, NPA's Appeals Board made an exception in the case of Solvay Process Division, Allied Chemical & Dye Corp. Instructed to tabulate minimum requirements for expanding its natural gas reforming facilities at Hopewell, Va., and South Point, O., the company reported these would be 570 tons of carbon steel products, 6000 pounds of copper tubing and 49,000 pounds of copper tubing and 49,000 pounds of copper wire. The request was granted "in the interest of national defense."

Come and Get It . . .

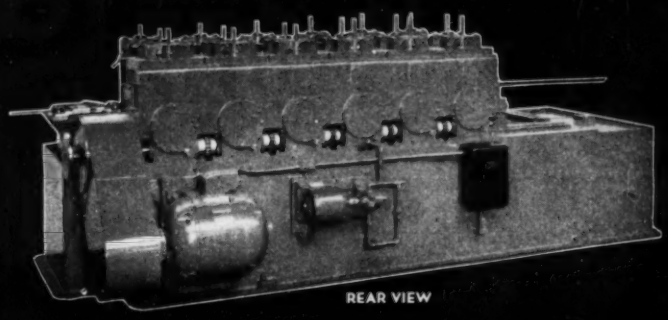
Have a problem in materials substitution? Need help in solving process difficulties? If so, Leslie E. Neville is the man to see. He's director of the Armed Services Technical Information Agency, recently set up in the Defense Department to aid contractors and subs. Mr. Neville comes from Curtiss-Wright Corp.; he got background for his present job as director of Standard Aeronautical Indexing System for the Institute of Aeronautical Sciences.

Primary job of ASTIA is gathering data on materials and processes as they become available. There has been no such central repository before—and much valuable information was lost and solutions to particular problems had to be sought repeatedly and needlessly. Headquarters of the agency is located at 5D518 The Pentagon, Washington 25; Mr. Neville can be reached on LIberty 5-6700, Ext. 73414.

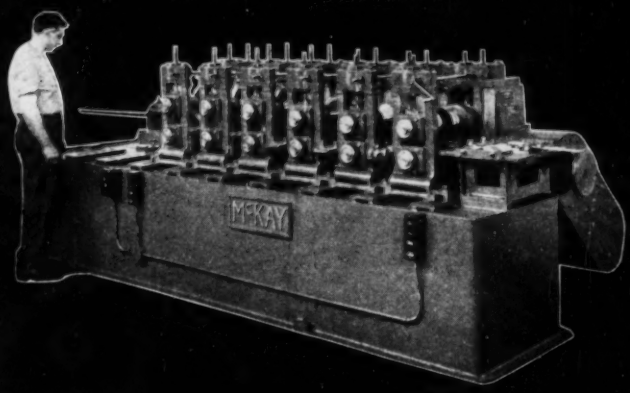
McKAY

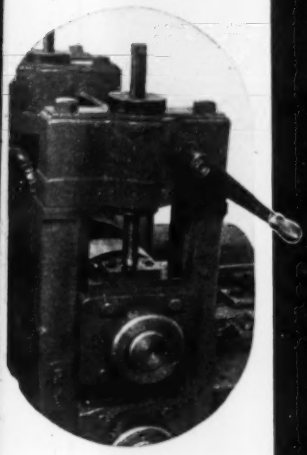
ROLL FORMING MACHINES FOR PRODUCING SHAPES FROM FLAT STRIP.

There's a McKAY Machine to Make Every Section



REAR VIEW





McKAY
MICROMETER
(patented)

STANDARD FEATURES

MICROMETER ADJUSTMENT. All pressure points on top shaft controlled by simple crank motion, through worm and gear reduction. Top shaft is ALWAYS PARALLEL. Micrometer dial furnishes visible check on roll pressures.

TYPICAL RUGGED McKAY CONSTRUCTION. Standardized units, choice of gearing, anti-friction bearings throughout, all gears between bearings. NOT OVERHUNG.

INTERCHANGEABLE GUIDING EQUIPMENT. easily adjusted, quickly removable.

MINIMUM CHANGEOVER TIME. All units engineered to allow complete roll change in shortest possible time.

LOW MAINTENANCE COST. All of the foregoing features, plus precision workmanship and up to the minute engineering, are a guarantee of low maintenance.

OPTIONAL FEATURES

BASE EXTENSION. Permits increasing the number of roll passes to meet future requirements, by the addition of standard housing units at a later date.

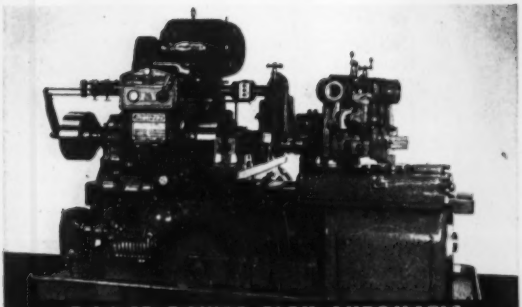
MOTOR DRIVEN COOLANT PUMP. Supplies flushing fluid to the rolls at each roll pass, and provides a rust preventative treatment to the formed strip. Tanks for fluid are built integral with the welded steel base

ENGINEERS
AND MANUFACTURERS OF
TUBE MILLS
USING
ELECTRIC RESISTANCE WELD
OXY-ACETYLENE WELD
ATOMIC HYDROGEN WELD

The **McKAY MACHINE** Company
ENGINEERS AND MANUFACTURERS OF SHEET, TIN, AND STRIP MILL EQUIPMENT
YOUNGSTOWN, OHIO

PERFORMANCE RUGGEDNESS
PRECISION AND SAFETY.

One SET OF COMBINATION TOOLING ON THE P&J 5D AUTOMATIC DOES IT FOR ALL 4 JOBS

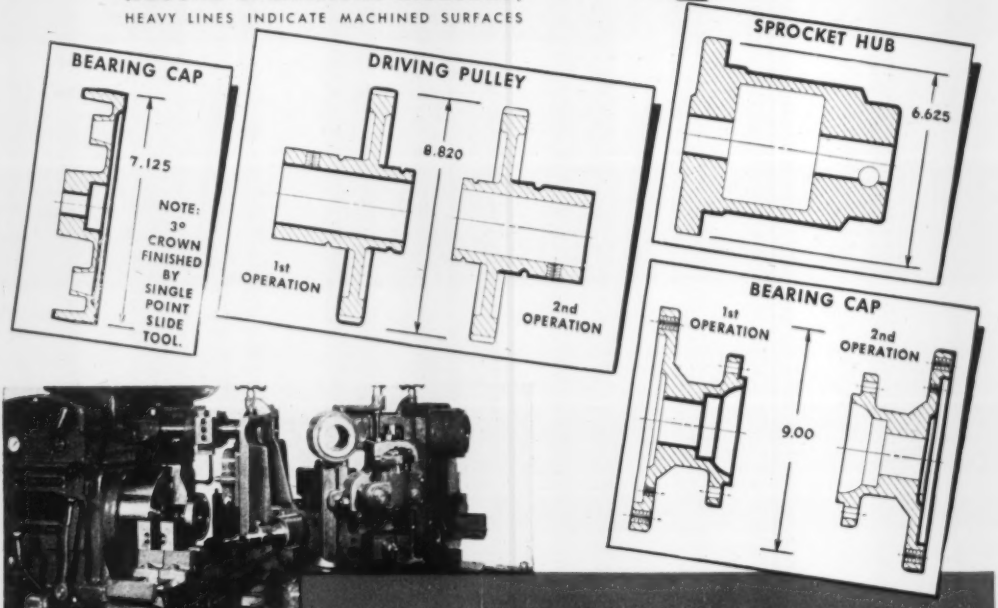


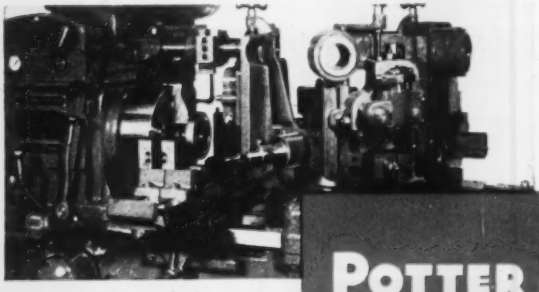
P&J 5D POWER-FLEX AUTOMATIC

Available in 3 sizes: Standard, Elevated and Long Travel. Swing over bed 30"; swing over cross slide 17". Spindle speeds up to 610 rpm.

(SECOND OPERATIONS INCLUDED)

HEAVY LINES INDICATE MACHINED SURFACES





Numerous similar examples of productivity with P&J Tooling on P&J AUTOMATICS are illustrated in this free Booklet. Write for your copy.

POTTER & JOHNSTON Co.

Subsidiary of PRATT & WHITNEY
Division NILES-BEMENT-POND COMPANY
PAWTUCKET, RHODE ISLAND, U.S.A.

Precision Production Tooling for 53 years

P&J

Guillotine for Games

Coin-operated amusement machine makers are pounding on every door for defense work

RELEGATED to the lowest rung on the essentiality ladder, the amusement machine industry has one consolation: Its facilities can be adapted easily to produce a variety of defense-needed goods.

Convert it must, and quickly too, for first-quarter materials allotments will force operations below the economic break-even point. There will be fewer and fewer new coin-operated pinball machines, juke boxes and a variety of skill games—those fiendishly clever electric and electronic gadgets that ring bells, flash lights and compute scores with all the extravagance of a Hollywood musical.

Tilt—It's the misfortune of the games industry that it requires for production two metals in greatest demand for defense—copper and bronze. No industry ranking so low in essentiality will get much copper wire and brass mill products in the first quarter—requirements for those materials were 166 and 175 per cent, respectively, above supply. Steel allowances are below those to consumer goods producers because amusement machines can get only 6.9 per cent of the brass mill products used in base period. Copper wire mill products allotment (28 per cent of base) is a little above the consumer goods level because it is the controlling material in this industry.

Amusement machine makers well remember getting the guillotine in World War II. Their use of scarce materials was cut by 25 per cent in four successive months until they were put out of business completely.

Remedy—Mindful that they're in much the same circumstances again, these producers are pounding on every door with defense work potential. Hundreds of firms that produce coin-operated amusement machines (a handful of Chicago firms dominate the industry) are demonstrating how their facilities can be used for screw machine parts, stampings, dies, wiring harnesses, precision assembly.

Because the industry materials-wise is on half-rations now, and will reach the starvation point at the turn of the year, speed is of essence in lining up work. Most producers are moving back into the varied fields they served in World War II, when their products ranged from radar to machine tools, bullet cores to parachute harnesses. Specialties include fuzes, radar sweeps, bombsights, walkie-talkies and training devices.

Offer—Right now about 75 per cent of any amusement machine factory could be used for defense work. The industry offers qualities valuable to nearly any potential customer: Skilled workers, sound engineering departments, modern plants and equipment with plenty of assembly space. These qualities pulled the industry through its last crisis; it's counting heavily on a repeat performance today.

Fewer 'Jukes' Next Year

Slashed allotments will curtail production of juke boxes by 25 per cent this year, perhaps half-again that much next year.

First quarter, 1952, allotments to the coin-operated phonograph industry are 646 tons of steel, 17,134 pounds of copper and 98,948 pounds of aluminum. Replacement units, major part of the industry's business, for the 400,000 juke boxes operating in this country normally average 60,000 units per year.

The seven firms in the industry employ about 2500 persons and have already experienced a boom and a bust since being shut down during World War II.

Luria Buys $1 Million Equipment

Luria Bros. & Co. Inc., Philadelphia, has purchased about $1 million worth of mining, tunneling and construction equipment used by Samuel R. Rosoff, the subway builder, in developing a 17-mile aqueduct into Baltimore.

The equipment—cranes, hoists, bulldozers, pumps and blowers, electrical items, compressors, mining locomotives and construction apparatus originally bought new for the aqueduct job—are stored at Randallstown, Md., where Luria has opened a field office to liquidate the purchase.

Used Bridges: They Help Span Structural Gap

WANT TO buy a bridge?

The transaction would be a far cry from the fabled confidence-man deals for the Brooklyn span. A legitimate traffic flourishes these days in bridges, encouraged by these two factors: Obsolescence of some structures because of heavier highway and railroad equipment; the shortage of structural steel and the high demand for the used material.

Relocated—Some bridges are moved intact to a location where lighter duty will be required; others are dismantled and the steel is used for structural purposes, often in buildings. The price of an old bridge varies widely. In one of the most recent deals, Kern county, Calif., paid $14,000 for 16 girders once used in the San Diego electric railway system. Eight of the 60-foot sections will be used in a new bridge over the Kern river near Bakersfield. The rest will be stockpiled. Purchased new, the 16 girders would have cost at least $40,000.

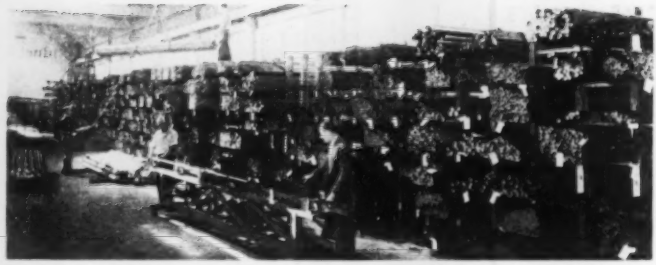
TRAFFIC IN BRIDGES

. . . some moved intact, others not

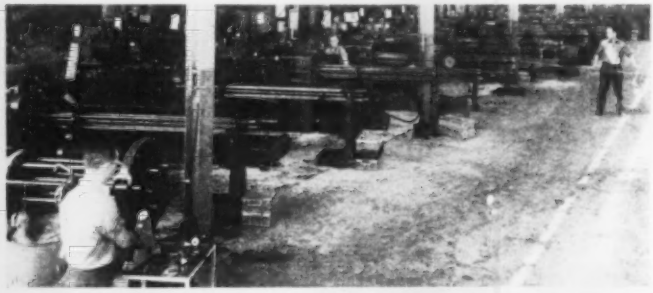
American Institute of Steel Construction points out that many bridges built 25 or more years ago are now inadequate for new loads. The institute's executive vice president, L. Abbett Post, says: "While it is possible to reinforce a steel bridge, it is often much more satisfactory to take it down and replace it with a heavier bridge. The unit made obsolete is in most cases satisfactory for some lighter type of use."

Covered—Under CMP rulings, all structural steel, whether new and used domestic or foreign, must be allocated. Any project such as the Kern bridge still has to get NPA approval, but that O.K. is fairly easy to win because the county already has the steel lined up.

No department store turn-over occurs in bridge sales, but at least one unit has occupied three locations in 45 years. A 335-foot span now over the Middle river near Stockton, Calif., was originally built in 1905-06 near Courtland, Calif., moved in 1926 near Rio Vista and shifted again this year. Waco, Tex., got a bridge over the Brazos river for a total of only $30,500 when it bought the unit that had been used for 37 years by an interurban railroad. Virginia got a new 1416-foot bridge at Lowman's Ferry by assembling seven old spans from various locations.



ONE BIG AEROQUIP JOB IS TO FURNISH SUPPLIERS WITH MATERIALS
. . . raw materials inventory is a major task



NOT ALL THE FIRM'S PRODUCTS ARE MACHINED BY SUBCONTRACTORS
. . . Aeroquip has a battery of screw machines at its Jackson plant

Subcontract; It Pays

By utilizing subs Aeroquip helps many small businesses and produces many defense items

THE SUBCONTRACTING IDEA was what Aeroquip Corp. was founded upon. The Jackson, Mich., firm expected only to develop engineering things like hose fittings and self-sealing couplings when it was incorporated in 1940. When it couldn't get enough subcontractors it started to manufacture itself. But, by the nature of its products (over 800) and components (over 2700) and to maintain flexibility and speed, it always bought a large portion of its requirements from subcontractors. Was that wise? Aeroquip thinks so. Its shipments this year will double those of last. Shipments at present are at an annual rate of $20 million.

SUB: BENTON HARBOR MALLEABLE
. . . craftsman makes a sand core

SCREW PRODUCTS: PHILLIPS MFG.
. . . inspecting to meet rigid standards

Winners of Defense Contract Derby for '51

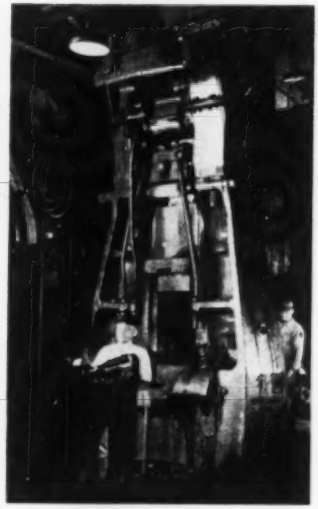
REGION II (area limits of defense mobilization agencies), comprising New York and New Jersey, received $6,973,723,000 or 23.6 per cent of all prime military contracts let in fiscal year 1951. Region II thus received the largest amount of defense contracts, both procurement and construction, for that time. Region VI, comprising Ohio, Michigan and Kentucky, ran a good second, receiving $4,712,126,000 or 15.9 per cent of all prime contracts awarded during the fiscal year, 1951.

This standing does not reflect subcontract work that is important in Ohio and Michigan, nor does it reflect work done by branch plants of companies having many locations where only the contractor's main office is recorded, says George A. Moore, regional director, U. S. Department of Commerce, Cleveland. Region VI has recorded less than half the number of manufacturing establishments (24,439) as have been recorded in Region II (58,574).

Statewise, New York led in total contracts awarded, with California, Michigan and Ohio following in that order.

Recent contracts awarded by the government, in excess of $250,000, follow:

Product	Contractor
Vertical boring and turning mills	King Machine Tool Div., American Steel Foundries, Cincinnati
Machinery & Equipment (3 contracts)	General Motors Corp., Detroit
	Union Carbide & Carbon Corp., Kokomo, Ind.
	Telechron Inc., Ashland, Mass.
Trestles, aluminum and steel	Towner Mfg. Co., Santa Ana, Calif.
P-3 Bomb Dollies	Fruehauf Trailer Co., Detroit
Aviation Armament	Maxson Engineering Div., W. L. Maxson Corp., New York
	Chance Vought Aircraft Div., United Aircraft Corp., Dallas
Fuel Injection Systems	Bendix Aviation Corp., South Bend, Ind.
Components for Automatic Pilot	Sperry Gyroscope Co., Sperry Corp., Great Neck, L. I., N. Y.
Range Finders	Northrop Aircraft Inc., Hawthorne, Calif.
Fuzes	Deerfield Mfg. Co., Mason, O.
Boosters	Schaible Co., Cincinnati
Rifle Grenades	Carey-M-Fall Co., Philadelphia
Steel Cartridge Cases	Rheem Mfg. Co., New York
Tape Writers, Converters, Printers	Radio Corporation of America, Camden, N. J.
Controls, C-4350 GRC	Garod Radio Corp., Brooklyn, N. Y.
Radio Receivers	Motorola Inc., Chicago
Mountings, MT-299	Parkchester Machine Corp., New York
Spare Parts	Ideal Electric & Mfg. Co., Mansfield, O.
	Marathon Electric Mfg. Corp., Wausau, Wis.
Repair Parts for Diesel Engines	Sterling Engine Co., Buffalo



BUCKEYE FORGING CO.
. . . steel forgings to strict design

CHECKLIST ON CONTROLS

Materials Order

ZINC—Amendment of Nov. 23, 1951, of NPA Order M-9 reduces from 20 tons to ten tons the amount of slab zinc that can be purchased in any one month without an NPA allocation certificate. It will be effective Jan. 1, 1952.

Controlled Materials Plan

Amendment of Nov. 23, 1951, of CMP Reg. 1 provides a consolidated regulation incorporating all previous amendments, as well as new changes made necessary by 100 per cent coverage of CMP. Principal among new changes is amplification of the definition of controlled materials. Another change in the regulation, made through amendment of Direction 1, is the substantial raising of the quantities of controlled materials for which manufacturers of Class B products need not apply to NPA, but for which they may self-certify their orders for second-quarter 1952 delivery. A provision effective Jan. 1, 1952, extends from seven to 15 days after expiration of a quarter the period during which a controlled materials consumer may accept a carryover order originally placed for delivery in the previous quarter, without charging it against his allotment for the quarter of actual shipment. Reprinted are Directions 1, 2, 3, 4, 6, 7 and 8. Direction 5 was revoked.

NPA Delegation

SOLID FUELS—NPA Delegation issued Nov. 20, 1951, and effective Nov. 21, 1951, delegates authority to the Secretary of the Interior to administer NPA Order M-87, issued Oct. 24, 1951, and providing special assistance for solid fuels producers to obtain maintenance, repair and operating supplies and capital additions.

Price Regulations

NEW PRICING—Amendment 24 of the General Ceiling Price Regulation and Amendment 34 of Ceiling Price Regulation 22 gives manufacturers additional flexibility in determining ceiling prices for commodities in new categories. Both amendments were effective Nov. 26.

CAPEHART ADJUSTMENTS—Revision 1 of Supplementary Regulation 2 to Ceiling Price Regulation 22 provides a method by which manufacturers who are applying for price adjustments under the Capehart Amendment can calculate an overhead cost adjustment factor. Revision 1 was effective Nov. 26, 1951.

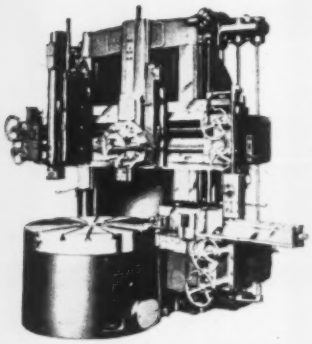
HIGHLAND PLATING DOES ANODIZING AND PLATING WORK FOR ITS PART
. . . also works for Aeroquip's West Coast subsidiary, Aero-Coupling

FORGING AT SCOVILL MFG.
. . . product: aluminum hose fittings

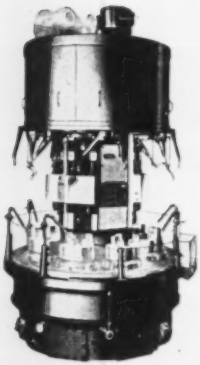
BROACHING: TEER WICKWIRE
. . . surface machining a forging

SCREW MACHINES FAN OUT OVER MUELLER BRASS CO. FLOOR
. . . a few of the machines that produce thousands of parts

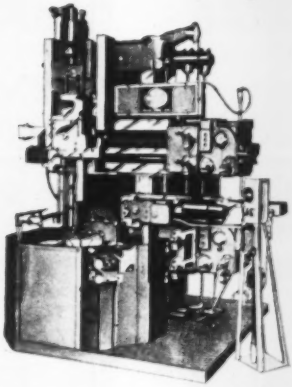
Select BULLARD for Manufacturing Economy



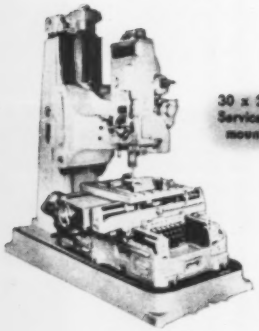
Cut Master Vertical Turret Lathes in six sizes 30" — 36" — 42" — 54" — 64" and 74". The 30" and 36" sizes have two heads while 42" — 54" — 64" and 74" have three heads obtainable in various combinations



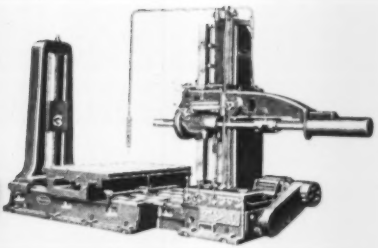
Mult-Au-Matic Type "D" 8" — 12" — 16" with 6 or 8 spindles, Type "D" 16-23 and Type "E" 6 spindles — twin 6 spindles — 8 spindles and 8 twin spindles



Mult-Au-Trol V. T. L.'s in six sizes 30" — 36" with two heads 42"—54"—64"—74" with three heads



30 x 20 Spacing Table mounted on Super Service Drilling Machines. It may also be mounted on 4' — 5' or 6' Radial Drills



4" and 5" Spindle Horizontal Boring, Milling and Drilling machines are available with various Rod Lengths and Post Heights

THE BULLARD COMPANY
BRIDGEPORT 2, CONNECTICUT U. S. A.

By H. C. TUTTLE *Detroit Editor*

Mirrors of Motordom

Gospel of free enterprise pours from Detroit as opponents of government controls wage an active campaign. One idea is a comic-strip story of industrial greats

DETROIT

THE MOST vocal opponents of government controls are headquartering in Detroit.

That's not unnatural, since this is a city where the highly individualistic Henry Fords, Walter Chryslers and Charles Ketterings have flourished and are still holding forth.

Birth Spot—Ideas for spreading the gospel of free enterprise and decontrols are pouring forth from Detroit. One is a campaign initiated by Bohn Aluminum & Brass Corp. It's an institutional program in magazines and television. Another campaign is also outstanding, partly because of its technique and partly because of its message. This is the comic-strip story of men who because of free enterprise rose from the most humble beginnings to become industrial "greats."

Edward Geller, an advertising salesman for the *Detroit Free Press*, began his missionary work through the comic-strip medium only four years ago. Appearing in the Sunday comic pages once a month, this strip has been syndicated and now is used regularly by twelve newspapers. Though it last year won the Freedom Foundation award, the work has only begun, says Mr. Geller, and soon he will have men on the road selling sponsorship of the strip and newspaper use of it.

The material will be available twice a month, and in the near future will also appear in book form to be bought by companies for distribution among their employees.

Simple Idea—Mr. Geller's format is simple. He tells in pen and ink drawings the adventure story of the life of every industrialist whom he selects. Many have been from the automotive or allied industries, but not nearly all. No company wanting to support this work is allowed to do so anonymously.

The latest of Mr. Geller's series, though making use of the same technique, relied on the broad appeal of things automotive to convey its message. As a two-page spread in a weekday issue of the *Free Press*, it dealt more with the industry as a whole than with the individuals who created it.

The Little Thing—Part of the reason for its effectiveness, verified by Mr. Geller in talking to industrial workers, is its use of small happenings which have changed the course of industrial history. In this latest picture-story it is pointed out that Cleveland might have been motordom's capital; 90 firms in that city once produced automobiles. Some of the early stunts aimed at proving cars' dependability are also depicted.

Steel Price Hike Would Pinch

A steel price increase as soon as wage boosts for the steelworkers are approved would put automakers in a tight corner. Lower output, unrecovered cost increases, and this week's one-cent higher labor rates as a result of the escalator clause have caused a belt-tightening throughout the industry.

Labor in Detroit is hitting out in all directions, decrying inflation while damning wage stabilization board policies, seeking 40 hours pay for 30 hours work, wanting a city WPA project to put laid-off workers back on a payroll. It is an unco-ordinated effort in which, quite often, heads bump squarely. Most frequently involved is the wild-running Ford Local 600, headed by Carl Stellato, whose animosity toward Walter Reuther has become legendary.

A few weeks ago when Reuther was too busy to see a large delegation of local 600 boys who demanded audience, they strewed their load of cards—some 30,000 purporting to contain signatures of members who wanted the 40-hour pay, 30-hour work rule laid down—all over the corridors of the UAW's "solidarity house."

Tool and die workers in this lo-

A TWO-FROM-ONE PLAN: First hull for the Gruman Albatross air-sea rescue plane to be built by Plymouth Division rolls from the Chrysler Corp. plant at Evansville, Ind. The Plymouth four-door sedan was also built at the same plant. The hulls will be shipped overland on specially built trailers for final assembly at the Gruman plant in Bethpage, N. Y. The first hull was completed only five months after defense work was started at the plant at Evansville, Ind.

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cal are pressing for the International to carry the ball on their request that WSA reconsider its refusal of a 28½-cent hourly pay boost, a refusal which caused them to wild-cat strike for one day.

The works project is a suggestion by Briggs Local 212 to the Detroit City Council for street repair and other construction programs to be financed by sale of bonds as long as Detroit industrial unemployment remains high. If thumbs downed on this proposal, the local seeks a moratorium on evictions and on repossession of belongings.

Pending are damage suits by Hudson and Ford Locals against these companies, the separate allegations being that Hudson locked out its workers last summer, and that Ford is depriving workers of jobs by decentralizing operations.

Capehart May Not Be Used

Expectation that the Capehart amendment will open up an opportunity for automakers to recover their cost increases up to last July 26 can not be interpreted as meaning that all companies will do so. That's despite the fact that field stocks of cars are low and demand, say many sales managers, is not being satisfied with present production. Several companies announced their displeasure earlier this year over not being able to price their products on the basis of the Capehart formula, and it is the avowed intention of a few to do so at the earliest opportunity. But the unwillingness of dealers to seek to obtain ceiling prices for used cars, and the likelihood that even lower used car ceilings will be considerably above offering prices is causing factory sales chiefs, who use the used car market as one of their most important guides, to be somewhat hesitant to conclude that the traffic will bear an increase on '52 cars.

New Models Come Out

Against these economic backdrops, the automotive industry nevertheless goes through with its traditional motions of new model introductions as though it had nary a care. Scheduled for "sneak" previews to newsmen this month are Buick, Hudson, Studebaker, Mercury and Lincoln, possibly others. Latest car to be shown is Pontiac, which does more than change the headdress on its traditional Indian to differentiate it from '51 models.

Auto, Truck Output

U. S. and Canada

	1951	1950
January	645,688	609,879
February	658,918	505,593
March	802,737	610,680
April	680,281	585,705
May	695,898	732,161
June	653,682	897,853
Six Mos.	4,137,204	3,941,878
July	522,858	746,801
August	571,442	842,335
September	505,758	760,847
October	548,350*	796,010
November	468,000*	833,784
December		671,622
Week Ended	**1951**	**1950**
Nov. 3	118,743	177,122
Nov. 10	117,342	161,038
Nov. 17	120,767	122,498
Nov. 24	80,489	122,716
Dec. 1	110,000*	152,107

Sources: Automotive Manufacturers Association, Ward's Automotive Reports. *Preliminary.

Feature of the car is an entirely new power train, headed off by a 7.7 to 1 compression-ratio engine, and followed by a new "dual range" hydra-matic drive, and low rear-axle ratio. The combination should satisfy any driver who likes to start off like a jack-rabbit. The higher compression-ratio engine is obtainable only in combination with the improved transmission unit and new rear axle. The engine with standard head has the same compression ratio as last year's design—6.8 to 1—although it turns up four more horsepower in the six-cylinder design and two more in the eight. With the optional high-compression head the six is rated at 102 hp and the eight at 122 hp, two and four hp, respectively, above the standard cylinder head-equipped power plants. With standard head, the engine uses 82 octane gasoline, 90 octane is suggested for the higher compression head.

The change in hydra-matic involves the adoption of two driving ranges — a traffic or mountain range, and a country driving range. In the first of those, selected by moving the control lever to the arrow on the right side of the "DR" position on the indicator, the transmission goes through the normal first, second and third gear speeds. The other range, obtained by moving the selector to the left side of "DR" gives a 1-2-3-4 gear range that functions like an overdrive.

Plating Method Wins Nod

Acceptance of the "white brass" method of plating auto parts (STEEL, Aug. 6, p. 57) has been quick wherever platers have been able to develop enough savvy with the necessary brighteners and can control their solutions properly.

Used first with relatively small items such as screws, it now is being experimented with as a finish for such large pieces as radiator grille sections. Investigation by one major auto company leads it to believe that regardless of future availability of nickel it will widen its use of copper-zinc finishes.

Sears, K-F Deal Breeds Storm

Reaction to the deal Kaiser-Frazer made with Sears to market a Henry J-like car was an outcry in many dealer circles. Some K-F dealers are waiting to see how it works out before expressing themselves, but many like nothing about it, not even the promise that they will undoubtedly get the service work on those Allstates.

A potent group which doesn't like the tieup is the industry relations committee of the National Automobile Dealers Association. Its chairman says: "This method of retailing and merchandising passenger cars can only lead to disruption of established auto retail practices, and regardless of promises to the contrary, the purchasers of those vehicles may suffer from the lack of availability of replacement parts and good service."

Planned is a complete investigation of "this trend" and a report to the directors and executive committee of NADA.

Rough Roads Ahead

If you think the highways are in bad shape now, hang tighter to the wheel. They're going to get rougher. For the last quarter of 1951, DPA allotted 250,000 tons for all state, county and city needs, of which 100,000 tons was for structural steel shapes.

SCRAP is vitally needed

100,000 tons per day

every pound counts

turn it over to your local dealer

ARISTOLOY STEELS

COPPERWELD STEEL COMPANY

MAKERS OF ELECTRIC FURNACE STEELS

WARREN, OHIO

117 Liberty Street
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Chicago, Illinois

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Cleveland, Ohio

7251 General Motors Building
Detroit, Michigan

325 West 17th Street
Los Angeles 15, California

1140 Lockwood Drive
Houston 20, Texas

528 Fisher Building
Detroit, Michigan

3104 Smith Tower
Seattle, Washington

Monadnock Building
San Francisco 5, California

LOOKING FOR STEEL?

ALTHOUGH steel is scarce, you may find half of your next month's needs lying around your own plant!

It takes one ton of iron and steel scrap to make two tons of open hearth steel ingots. It takes 100% scrap to make an electric furnace steel ingot. And there's a good chance that plenty of this sorely needed scrap is gathering dust and rust within a stone's throw of your office.

Lack of scrap is today's big bottleneck in steel production. And you can't hope to get the steel you need unless the steel producers get the scrap that *they* need. You can start lending your support today by appointing a top official in your plant to take full responsibility for surveying the plant and getting out the scrap.

Scrap is everywhere, not just in the form of production scrap—but also in the form of idle metal: obsolete machines and tools, no-longer-useable jigs and fixtures, gears, chains, pulleys, valves, pipe, abandoned steel structures, etc.

Remember—the more scrap, the more steel. Do yourself, and your industrial neighbors, a favor—set up a scrap salvage program in your plant today! For a complete plan on "how to do it", write the Advertising Council, 25 W. 45th Street, New York 19, New York.

The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, O. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

Specialists in alloy steel—including hot rolled and cold finished alloy steel bars—a complete range of stainless, graphitic and standard tool analyses—and alloy and stainless seamless steel tubing

The Business Trend

Factors tending to keep prices in check this year won't be present in 1952 and inflation controls will get a stiff test. Industrial production index sinks with holiday

INFLATION worries will haunt businessmen much more in 1952 than they do now. Most people consider a moral victory is being won this year by limiting prices to about a 5 per cent gain. Several factors contributing to this "victory" won't be present in 1952.

For one thing defense spending will be higher, generating jobs and high wages without increasing goods and services available for consumption. Another factor is civilian buying, comparatively slack this year because consumers sated themselves in the six months following Korea. Inventories, top-heavy throughout most of 1951, are already falling off as goods aren't being produced fast enough to replace those sold. With a lid on civilian manufacture next year inventories will skid sharply and prices will push ceilings as more buyers bid for fewer goods.

If the wage formula is broken by the steelworkers, all industry will get raises, forcing price hikes on most products. High taxes will slough off some excess purchasing power created; deficit financing by government will put much of it back.

Expect no production peaks to be reached this month. Industry is having a tough time keeping a sustained pace through cold weather and vacation periods. STEEL's industrial production index slumped 13 points in the week ended Nov. 24 to 200 per cent of the 1936-1939 average. That's two points higher than the reading for last year's comparable week though.

The Reason Why. . .

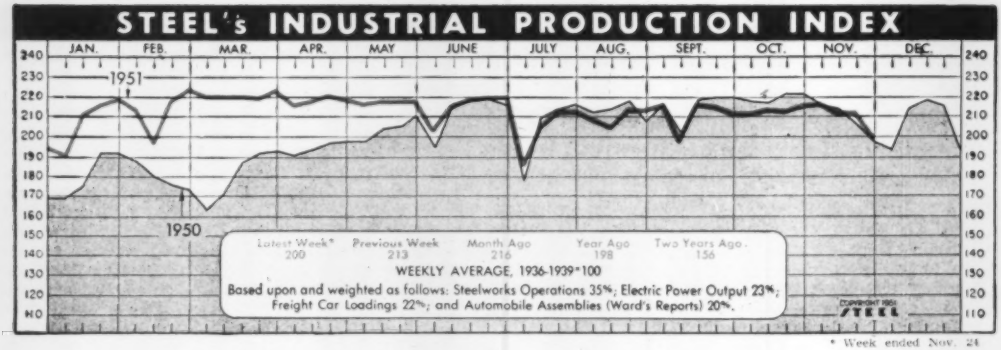
Drop in the index was caused primarily by automobile assemblies, at one of the lowest levels in the postwar period. Netted were 80,489 passenger cars and trucks from both U. S. and Canadian plants. U. S. assemblers' volume dropped 36 per cent from the prior week; the year before only 25 per cent was lost by holiday observance, says *Ward's Automotive Reports*. Changeovers, inventory-taking and gearing production schedules to fourth-quarter quotas caused the long holiday. *Ward's* says about 356,000 cars and 96,000 trucks were built in November (363,000 cars and 102,000 trucks were authorized). With one month yet to go this year, 1951 has already surpassed total 1949 vehicle production and has moved into the position of being second-best year in auto history.

The Somber Side. . .

November business wasn't so good, say member executives surveyed by National Association of Purchasing Agents. Conditions didn't support the upgrade trend of industrial activity they found developing in September and October. Back orders took a further drop and production lagged a bit behind the order position. Prices were strong and buyers expected them to continue so because of OPS authorization to apply the Capehart amendment. The survey found industrial demand slowing as civilian product manufacturers adjusted schedules to lower controlled materials allotments. Industrial materials inventories are leveling off at the low

BAROMETERS of BUSINESS

		LATEST PERIOD*	PRIOR WEEK	MONTH AGO	YEAR AGO
INDUSTRY	Steel Ingot Output (per cent of capacity)†	103.0	101.0	103.0	102.5
	Electric Power Distributed (million kilowatt hours)	7,157	7,333	7,234	6,507
	Bituminous Coal Production (daily av.—1000 tons)	1,913	1,900	1,896	2,000
	Petroleum Production (daily av.—1000 bbl)	6,210	6,237	6,340	5,888
	Construction Volume (ENR—Unit $1,000,000)	$163.1	$312.9	$189.1	$235.1
	Automobile and Truck Output (Ward's—number units)	80,489	120,767	121,215	122,716
	*Dates on request. †Weekly capacities, net tons: 1951, 1,999,035; 1st half 1950, 1,906,268; 2nd half 1950, 1,928,271.				
TRADE	Freight Car Loadings (unit—1000 cars)	730†	814	864	701
	Business Failures (Dun & Bradstreet, number)	149	109	155	170
	Currency in Circulation (in millions of dollars)‡	$28,701	$28,601	$28,301	$27,450
	Department Store Sales (changes from like wk. a yr. ago)‡	+2%	+7%	+10%	+8%
	†Preliminary. ‡Federal Reserve Board.				
FINANCE	Bank Clearings (Dun & Bradstreet—millions)	$18,836	$13,801	$17,004	$17,265
	Federal Gross Debt (billions)	$258.1	$257.9	$258.3	$257.0
	Bond Volume, NYSE (millions)	$11.1	$9.5	$16.2	$20.7
	Stocks Sales NYSE (thousands of shares)	4,942	5,122	10,683	10,408
	Loans and Investments (billions)†	$72.5	$72.3	$71.5	$69.4
	United States Gov't. Obligations Held (millions)†	$31,457	$31,596	$30,976	$33,349
	†Member banks, Federal Reserve System.				
PRICES	STEEL's Weighted Finished Steel Price Index††	171.92	171.92	171.92	157.76
	STEEL's Nonferrous Metal Price Index‡	234.9	234.9	234.9	240.9
	All Commodities†	177.2	177.3	177.1	172.0
	Metals and Metal Products†	190.9	190.9	190.9	180.3
	†Bureau of Labor Statistics Index, 1926=100. ‡1936-1939=100. ††1935-1939=100.				


STEEL'S INDUSTRIAL PRODUCTION INDEX
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
1951
1950
Latest Week* 200
Previous Week 213
Month Ago 216
Year Ago 198
Two Years Ago 156
WEEKLY AVERAGE, 1936-1939=100
Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Reports) 20%.
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* Week ended Nov. 24

point of the year. Uncertainty of future CMP allotments is a big factor in short-range purchasing policy.

Appetite Hardly Whetted. . .

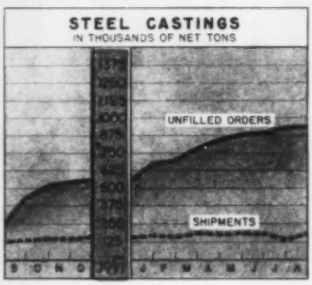
Though industry's appetite for steel is hardly whetted, the nation's mills continue their sustained above-capacity operating rates and are adding new facilities to supply even more steel. Schedules for the week ended Dec. 1 showed operations had moved up again; mills were expected to produce 2,079,000 tons of ingots and steel for castings. This output was 6000 tons higher than in the preceding week but about 10,000 tons below the industry's historic peak. A year ago output was cut by bad weather.

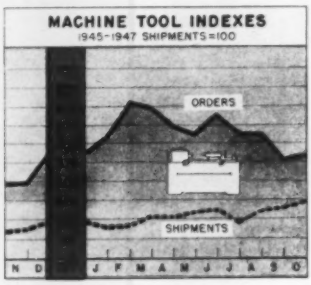
Speed Is of Essence. . .

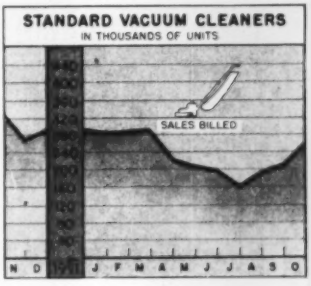
Higher volume of machine tool shipments is reflecting the extent of subcontracting by the tool builders (see STEEL, Nov. 19, p. 70). October shipments by the industry showed the sharpest monthly jump in nine years; from an index of 189.8 in September to 220.7 in October. The National Machine Tool Builders Association index, for metalcutting machine tools only, is based on average shipments in 1945-1947 as 100. The index should show sizable gains each month till next July, when output peak is scheduled to be reached. Because of the production spurt unfilled orders amounted to only 22.2 months work in October, compared to 23.5 months work in September. Productive capacity of the industry today is more than 60 per cent higher than at the beginning of 1951.

Change of Plan. . .

Household laundry equipment manufacturers are turning their attention away from washing machines to two other products that are getting more attention from customers: Automatic tumbling dryers and ironers. Fac-







Steel Castings

Thousands of Net Tons

	Shipments		Unfilled Orders*	
	1951	1950	1951	1950
Jan.	174.1	89.1	675.4	142.5
Feb.	164.0	91.8	707.4	165.2
Mar.	190.7	111.8	779.7	185.6
Apr.	181.9	107.0	846.9	201.6
May	186.2	117.9	881.7	198.0
June	184.7	131.1	895.1	206.8
July	147.2	98.3	930.0	255.4
Aug.	186.1	128.4	944.2	239.9
Sept.	.....	134.6	.....	428.0
Oct.	.....	149.6	.....	521.8
Nov.	.....	145.9	.....	537.7
Dec.	.....	155.3	.....	554.2

* For sale. U. S. Bureau of the Census.

Machine Tool Indexes

	New Orders		Shipments	
	1951	1950	1951	1950
Jan.	475.4	99.7	114.3	52.8
Feb.	615.5	89.2	123.8	56.1
Mar.	590.3	107.4	158.9	75.3
Apr.	516.1	98.9	157.7	61.6
May	483.0	116.4	173.1	82.5
June	558.8	124.1	182.8	91.9
July	490.6	253.1	144.7	68.3
Aug.	488.9	305.1	178.9	95.7
Sept.	380.2	280.6	189.8	101.6
Oct.	398.6	289.6	220.7	100.9
Nov.	.....	291.9	.....	110.9
Dec.	.....	410.1	.....	135.7

National Machine Tool Builders' Assn.

Standard Vacuum Cleaners

Sales Billed—Units

	1951	1950	1949
Jan.	282,305	249,150	228,769
Feb.	261,572	263,515	241,267
Mar.	290,242	361,014	309,897
Apr.	227,216	292,664	252,656
May	201,983	278,645	222,850
June	194,548	250,190	207,354
July	161,002	279,967	161,920
Aug.	191,299	341,232	219,909
Sept.	210,086	327,524	250,036
Oct.	259,469	331,445	272,520
Nov.	.....	265,310	253,516
Dec.	.....	288,756	265,513
Total	3,529,412		2,886,514

Vacuum Cleaner Mfrs. Assn.

Charts—Copyright 1951, STEEL

tory sales of standard-size household washers in October dropped 5.3 per cent (313,756 to 297,210) from September to October, but dryer sales aggregated 59,299 (up 35.5 per cent) and ironer sales amounted to 29,800 units (up 62.8 per cent). These manufacturers are permitted by NPA to switch steel from one product to related ones.

Human Touch. . .

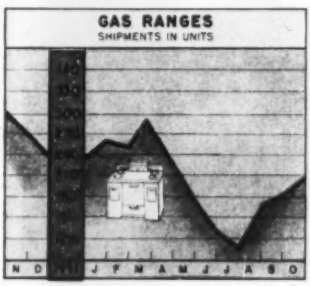
While nonfarm employment continued at a record high for the season in mid-October, production worker employment in manufacturing industries dipped slightly. The loss of about 150,000 from a year ago was caused by reductions in consumer goods industries outweighing gains in defense fields. Nonfarm employment —those in industry, commerce and government—was estimated at 46.8 million in mid-October by Bureau of Labor Statistics. Average workweek —40.4 hours in mid-October—dropped slightly from September and was nearly one hour lower than a year ago. Arms-producing industries were working longer hours though. Average weekly earnings of production workers in manufacturing plants amounted to $65.17, a gain of $3.18 from levels of a year earlier. The gain resulted both from advances in wage rates and from increased proportion of workers employed in higher-wage defense industries.

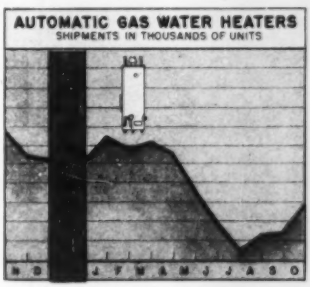
Trends Fore and Aft. . .

Government will be $4 billion in the red next July, says the Commerce Department (Treasury's estimate is $7.5 billion) . . . Total sales of retail stores in October, $13.1 billion were 6 per cent above a year ago; November volume will be even higher . . . Railroads had 1742 new locomotives on order Nov. 1 . . . Business failures increased 4 per cent in October to 644 . . . Oil industry profits this year will set an all-time high . . . Offerings of new securities by U. S. corporations during 1951's third quarter amounted to $1.4 billion, bringing to $5.6 billion the nine-month total . . . An estimated 52 million motor vehicles will be on U. S. roads at the beginning of 1952.

Issue Dates of other FACTS and FIGURES Published by STEEL:

Construction Oct.29	Furnaces, W. Air ..Nov.19	Purchasing Power ..Oct.8
Durable Goods Oct.8	Gear Sales Nov.5	Radio, TV Nov.12
Employ., Metalwkg..Nov.12	Gray Iron Castings.Nov.26	Ranges, Elec. Nov.26
Employ., Steel Oct.29	Indus. Production..Nov.19	Refrigerators Nov.26
Fab. Struc. Steel...Nov.12	Ironers Nov.5	Steel Forgings Nov.26
Freight Cars Nov.19	Malleable Castings.Nov.26	Steel Shipments ...Nov.5
Foundry Equip. ...Nov.12	Prices Nov.19	Wages, Metalwkg. ..Oct.22
Furnaces, Indus. ..Nov.12	Pumps, New Orders.July9	Washers Nov.5





Gas Ranges
Shipments in Units

	1951	1950	1949
Jan.	260,600	165,000	106,700
Feb.	254,000	209,000	117,700
Mar.	289,800	264,000	151,500
Apr.	225,000	239,100	150,100
May	177,800	242,800	151,600
June	128,500	217,000	162,200
July	116,400	254,800	125,800
Aug.	168,100	331,500	206,100
Sept.	182,800	287,000	227,300
Oct.	206,800	308,000	257,500
Nov.	.....	269,100	237,400
Dec.	.....	235,900	175,700
Total ...	.....	3,023,200	2,069,600

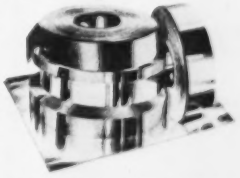
Gas Appliance Mfrs. Assoc.

Automatic Gas Water Heaters
Shipments in Units

	1951	1950	1949
Jan.	225,600	131,600	88,400
Feb.	213,400	156,500	84,500
Mar.	223,300	172,800	106,000
Apr.	199,400	176,400	115,200
May	167,400	195,200	120,200
June	131,500	207,100	132,200
July	102,400	197,500	114,400
Aug.	124,400	259,800	138,800
Sept.	127,100	222,600	147,300
Oct.	157,700	235,100	154,200
Nov.	.....	206,000	138,300
Dec.	.....	202,500	126,500
Total ...	.....	2,363,100	1,466,000

Gas Appliance Mfrs. Assoc.

LET'S TALK FLAT ROLLED STEEL PRODUCTS



Specializing in flat rolled metal products assures you a greater than usual interest for requirements in this range. Kenilworth's modern equipment and facilities are geared for almost instant service when order processing begins. So, when you have a need for spring steel (annealed or tempered), stainless sheets or coils, tin coated steel, shim steel and other flat rolled products, try Kenilworth first.

LET'S TALK ABOUT SUPPLY

Today's controlled and critical supply may be hurting you more than necessary. While our inventory varies, from day to day, it may be possible to assist you with your very need now. You can be certain you will get immediate and interested attention with an instant response of current availabilities.

LET'S TALK TO...

THE Kenilworth Steel co.
750 BOULEVARD
KENILWORTH, N. J.

SPECIALISTS IN FLAT ROLLED METAL PRODUCTS

Telephones: N. Y. COrtlandt 7-2427
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LET'S TALK ABOUT ALL OF KENILWORTH'S SERVICE

Custom slitting and shearing service for your metals to handle sizes from .001" to .187" in widths up to 36" is available — precision equipment assures minimum camber, minimum burr and closer than standard tolerances when required.

"Flying Workhorse" picks up 71% assembly savings...73% weight savings

Piasecki Helicopter Corporation uses Tubular SPEED CLIPS® to make spectacular savings over previous method of attaching blanket insulation

The "flying workhorse" for the Air Force and the Army, Piasecki's new helicopter carries aboard a top-flight example of SPEED NUT savings.

Blanket insulation has to be attached inside the craft in over 700 locations. The old fastening method needed revising to save assembly time and, more important, to save weight. The perfect answer . . . Tubular SPEED CLIPS and standard rivets. *They could take the place of complicated previous methods, and provide an amazing 71% assembly saving, and a total weight savings of 73%!*

Now Tinnerman Tubular Clips, along with hundreds of other SPEED NUTS, are specified for use on all Navy HUP-1 craft and also are used on the new Piasecki H-21 Air Force Assault and Army Transport Helicopter.

With today's production schedules . . . and budgets . . . it's well worthwhile to *"check the Tinnerman line before you design."* Write for more reasons why, presented in new 24-page booklet "A Story of Quality." TINNERMAN PRODUCTS, INC., Dept. 12, Box 6688, Cleveland 1, Ohio. *In Canada:* Dominion Fasteners Ltd., Hamilton. *In Great Britain:* Simmonds Aerocessories, Ltd., Treforest, Wales

OLD METHOD
CLIP
RIVET
NUT
WASHER
INSULATION BLANKET
GLOVE FASTENER STUD
GROMMET BUTTON
SPEED CLIP METHOD
TINNERMAN TUBULAR CLIP C 2733
INSULATION BLANKET
CLEARANCE HOLE
STANDARD RIVET
Drawings at left show obvious SPEED CLIP savings. Old method required complicated clip assembly to be riveted to panel. SPEED CLIP needs only clearance hole in existing panel and rivet to provide vibration-proof attachment.
TINNERMAN Speed Nuts®

Men of Industry

WILLIAM W. FULLER
. . . purchasing agent, Cleveland Chain

CHARLES D. McCALL
. . . New Departure general sales mgr.

PHILIP RYAN
. . . Cutler-Hammer executive V. P.

William W. Fuller was appointed purchasing agent, **Cleveland Chain & Mfg. Co.,** Cleveland. He was employed as industrial engineer for three years by American Steel & Wire Co., and previously held a similar position for two years with Carnegie-Illinois Steel Corp. **George P. Long** joined Cleveland Chain & Mfg. as assistant general sales manager.

Norman B. Weinke was elected vice president, **Cullman Wheel Co.,** Chicago. He heads up the sales organization and is also in charge of manufacturing. Mr. Weinke was production manager for many years, and recently became sales manager.

Edward K. Vaughan was transferred from the Chicago staff of **New Jersey Zinc Sales Co.** to the headquarters office in New York, where he will contact buyers of the company's Horse Head special slab zinc, alloys, rolled zinc and metal powders. **Robert L. Campbell,** formerly with the Chicago office in pigment division sales work, was transferred to the metal division and is assuming Mr. Vaughan's duties in the Chicago territory.

John R. Bausch was elected vice president in charge of finished products for **Dodge Steel Co.,** Philadelphia, manufacturer of electric steel castings.

Reeves Pulley Co., Columbus, Ind., manufacturer of variable speed control equipment, appointed **James A. Miller** as manager of its newly opened sales and engineering office in Los Angeles. He formerly was with Bryon Jackson Co. He will be assisted by **Harlan M. Gillis.**

Charles D. McCall was appointed general sales manager, **New Departure Division,** General Motors Corp., Detroit. He succeeds **Frank J. Miller** who severed his connections with the firm because of ill health. Mr. McCall, affiliated with GM since 1931, has been manager of New Departure's central regional office in Detroit for the last three years.

Hanson - Van Winkle - Munning Co., Matawan, N. J., appointed **Bernard C. Case** as manager of electrochemical development.

William L. Parlon was named general manager of **Elbeeco Inc.,** subsidiary of Aeroquip Corp., Jackson, Mich. He joined the company in June of this year as a project engineer. **Francis M. Davison** was appointed assistant treasurer.

James S. Anderson, who has been on leave from **Babcock & Wilcox Tube Co.,** Beaver Falls, Pa., returned to his duties as assistant general sales manager. He was serving in Washington as chief of the tubing section, Iron and Steel Division, Industries Operations Bureau, NPA.

Edward A. Murray was elected vice president-sales, **Appleton Electric Co.,** Chicago.

L. Reed Clark was appointed director of industrial relations for the Stamford, Conn., division of **Yale & Towne Mfg. Co.** He succeeds **Marvin C. Bonine,** recently made works manager of the company's Salem division. Mr. Clark has been manager of industrial relations for Richmond Radiator Co.

Philip Ryan was elected executive vice president, **Cutler-Hammer Inc.,** Milwaukee, in addition to his duties as vice president-manufacturing. **R. A. Millermaster** was appointed manager of the development department, and **C. W. Kuhn** was made director of development engineering.

Robert J. Minshall was elected president and general manager, and **G. V. Patrick** as vice president and assistant general manager, **Marvel-Schebler Products Division,** Decatur, Ill., Borg-Warner Corp. Mr. Minshall also is president of the Pesco Products Division, Bedford, O., and the Wooster, O., Division. Reorganization of the Marvel-Schebler executive staff was occasioned by the retirement from the presidency of **S. W. Gray.**

C. G. Linkfield was named chief engineer, **Ampco Metal Inc.,** Milwaukee, to surpervise engineering activities, especially those dealing with new products and tooling. He formerly was in charge of extrusion mill operations. **H. W. Pritzlaff** was named wrought products superintendent to succeed Mr. Linkfield. **J. F. Klement,** chief metallurgist, was advanced to technical director and will direct Ampco laboratories through two new chief metallurgists.

Patrick E. Sullivan was appointed assistant manager, Buffalo Tube Works, **General Electric Co.,** a newly created position. He has been works engineer since 1947.

A. F. Jordan was promoted to vice president and general manager, **Bennett Pump Division,** John Wood Co.,

Muskegon, Mich. He formerly was sales director.

Warren W. Frebel was appointed

WARREN W. FREBEL
. . . V.P.-purchasing, Majestic Radio & TV

vice president in charge of purchasing by **Majestic Radio & Television,** division of Wilcox-Gay Corp., Charlotte, Mich. He joined the division 13 months ago as director of purchases.

C & D Batteries Inc., Conshohocken, Pa., appointed **John F. Rittenhouse** executive vice president, and **Henry E. Jensen** chief engineer. Mr. Rittenhouse was vice president-engineering. Mr. Jensen joined C & D in 1950. He was formerly signal engineer in the Navy Department's Bureau of Ships.

Charles Smith was named manager, **A. O. Smith Corp.'s** product service division in Chicago. He succeeds **J. W. Spoor,** named general sales manager of the company's welding products division. **P. H. Fahrer,** former manager of the Los Angeles products service branch, was named assistant to Mr. Smith, and is succeeded at Los Angeles by **George Carlson,** former assistant at the Union, N. J., branch.

Quaker Rubber Corp., division of H. K. Porter Co. Inc., Philadelphia, appointed **J. J. Merkel** and **E. E. Klemm** branch managers of Detroit and Cleveland districts.

Automatic Transportation Co., Chicago, appointed **Harvey J. Hincker** chief engineer of its automatic department. He fills the post recently vacated by **Ressler A. Dusseau,** named assistant general manager.

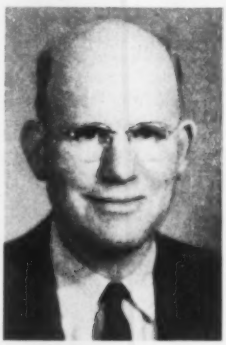
A. J. Lindemann & Hoverson Co., Milwaukee, appointed **G. J. Schramel** sales manager; **John A. Plano,** field sales manager; **R. H. Meiners,** manager of the refrigeration and special products division; **E. J. Thomes,** chief engineer; and **Christian Buerki** assistant chief engineer.

Henry A. Denny was promoted to production manager, engineering and construction division, **Koppers Co. Inc.,** Pittsburgh. He was assistant production manager, and succeeds **Frank Chambers,** resigned.

L. H. Bender, previously general supervisor-manufacturing control, was named superintendent of manufacturing control and contract administration for **Luscombe Airplane Corp.,** Dallas.

Paul T. Smith was promoted to chief accountant, and **C. W. Ashworth** to assistant chief accountant of **Texas Engineering & Mfg. Co. Inc.,** Dallas.

Standard Steel Corp., Los Angeles, appointed **James B. McClellan** fac-



JAMES B. McCLELLAN
. . . Standard Steel factory mgr.

tory manager in charge of all manufacturing activities. He was production manager, shipbuilding division, Consolidated Steel Corp., and more recently was superintendent, expanded pipe division, Consolidated Western Steel Corp.

Howard Herrick, vice chairman and chief executive officer of **E. W. Bliss Co.,** Canton, O., was elected president to succeed **Louis Edgar Jr.,** who resigned as president and as a director.

Dr. Robert J. Anderson left the light metals division, NPA, and joined **Southwest Research Institute,** San Antonio, Tex.

Continental Can Co., New York, elected as directors **John M. Franklin,** president and director of United States Lines Co.; **Paul C. Cabot,** president, State Street Investment Corp. of Boston; and **Stephen D. Bechtel,** executive head of Bechtel Corp. and its affiliates.

Joseph H. Cox, supervisor of electrical engineering and supervisor of quality control for the Sunnyvale, Calif., works of **Westinghouse Electric Corp.,** was promoted to engineering manager of the plant.

William Greenway was promoted to general manager of **Rice & Adams Equipment Division,** Pressed Steel Car Co., at Buffalo. He served as director of manufacturing for the division since May, 1950.

Harry V. Snow was appointed general manager, **James N. Davis,** sales manager, and **Leonard J. Heinle,** controller of the new **Iowa Ford Tractor Co.,** subsidiary of Dearborn Motors Corp. at Des Moines, Iowa.

Timken Roller Bearing Co. appointed **Sherman R. Lyle** district manager of its steel and tube division, northern Pennsylvania and New York state district. His office will be in Buffalo.

Rheem Mfg. Co., Richmond, Calif., formed a division known as Rheem International, and appointed **A. L. Walker** vice president to head the operation.

Karl V. Lindell was appointed vice president, **Canadian Johns-Manville Co. Ltd.,** Asbestos, Que., and general manager of its asbestos fiber division. In the latter position he succeeds **A. R. Fisher,** president of the firm.

Franklin E. Turton was elected vice president of **Braden Copper Co.,** a subsidiary of Kennecott Copper Corp.,

FRANKLIN E. TURTON
. . . Braden Copper V. P.

New York. He has been with Braden Copper Co. in Chile, S. A., for 38 years. For the last seven he was general manager in Chile, and has

MEMO

To: users of A.C. adjustable Speed Drives

From: THE LOUIS ALLIS CO.

50th YEAR

Only SELECT-A-SPEDE

offers the NEW MAGNETIC AMPLIFIER CONTROL
with superior performance
at no extra cost!

Easy to install and operate • Simple circuits, easy to maintain • Compact design saves floor space

OPERATOR'S CONTROL STATION
Any speed you select at your finger-tips (40:1 range available).
POWER UNIT
A. C. POWER INPUT
The speed you need, here . . . Once selected, the motor speed remains constant—regardless of load.
D. C. DRIVE MOTOR
Any rating up to 150 H.P.
All types of enclosures.

THE MAGNETIC AMPLIFIER

— HEART OF THE SELECT-A-SPEDE

The Magnetic Amplifier, a self-saturating reactor, like a transformer, contains no moving parts — no parts requiring maintenance or periodic replacement. Its function in the Select-A-Spede, is to constantly regulate the field currents of both motor and generator. It requires no "warm up" period, has an extremely fast response to changing conditions, and is completely reliable at all times.

For economical "on the spot" conversion of AC power for an adjustable speed drive (even better than a DC motor supplied from a constant voltage power supply) — the Louis Allis Select-A-Spede is unsurpassed. It is the only AC adjustable speed drive offering the advantage of the new magnetic amplifier control — with close speed regulation at all rated speeds and loads.

The Select-A-Spede also offers a variety of optional features, such as: reversing, dynamic braking, jogging, sequence control, controlled acceleration, interlocked slow speed start, multi-motor drives, etc. It is possible to provide a Select-A-Spede Drive to exactly suit your special requirements.

For further information, contact your nearest Louis Allis Application Engineer or write for Bulletin 1100-B.

LOUIS ALLIS

THE LOUIS ALLIS CO., MILWAUKEE 7, WIS.

W. H. WEBB
. . . Alkali sales mgr. for Detrex

GEORGE C. FLOYD
. . . V. P. Vanadium Corp. of America

ARTHUR H. LUCHS
. . . Round California Chain V. P.

been a director of the company since 1946.

W. H. Webb was appointed sales manager of alkali products for **Detrex Corp.**, Detroit. In the last ten years he has advanced through the positions of assistant manager, alkali division, assistant national accounts manager and central region manager.

C. George Beam joined the purchasing department of **Autoyre Co.**, Oakville, Conn.

Warren P. Moon was promoted to manager of cost research of **Lukens Steel Co.**, Coatesville, Pa. He replaces **George E. Stiteler,** assigned to assist Harold E. Bliss, assistant controller, in cost statistical budgetary studies associated with maintenance control project.

George C. Floyd was elected vice president, **Vanadium Corp. of America,** New York. Since 1947 he has been vice president of Thomas Steel Co.

L. D. Reed, for many years a sales engineer at the Chicago sales office of **Whiting Corp.,** has retired. In 1941 he organized the Philadelphia sales office and was district manager for two years. He then returned to the main office at Harvey, Ill., in a special engineering capacity for the war period, after which he became an executive engineer in the Chicago office.

B. M. Laney, who joined **Kaiser-Frazer Corp.,** Willow Run, Mich., as aircraft consultant, was made assistant works manager for all aircraft shifts. **Hugh Fry** becomes assistant works manager, first and third shifts.

Arthur H. Luchs, general manager of **Round California Chain Co.,** South San Francisco, Calif., was elected vice president. He has been with the Round organization since 1927, at which time he was employed by Seattle Chain & Mfg. Co. Mr. Luchs continues as general manager.

Joe M. Deal was appointed works auditor of **U. S. Steel Co.'s** Gary, Ind., Works. He was assistant works auditor, Irvin Works, Dravosburg, Pa.

Maj. Robert L. Brunner, recently returned after four years of service overseas, was appointed purchasing agent of **Hiram Swank's Sons,** refractory manufacturer, Johnstown, Pa. **Corp. G. R. Cope,** after three and a half years in the U. S. Air Corps, was appointed manager of the order department.

OBITUARIES...

John R. McDonald, president, **Peerless Machine Co.,** Racine, Wis., died Nov. 10.

Aubrey J. Sidford, 72, former vice president, **Behr-Manning Corp.,** Albany, N. Y., died Nov. 14. He retired from the firm in 1945 after 52 years of service with Behr-Manning and its predecessor company.

John J. Hayden, 45, vice president and secretary, **American Boiler Works,** Erie, Pa., died Nov. 15.

E. C. Schaaf, 49, formerly manager of the Columbus, O., and later the Atlanta warehouse of **Wheeling Corrugating Co.,** died Nov. 15. He retired in 1947.

John W. Gehl, 78, chairman of the board of **Gehl Bros. Mfg. Co.,** West Bend, Wis., died Nov. 18. He was secretary and general manager until a few years ago.

F. J. Griffiths, 74, executive and consultant in the steel industry, died Nov. 23. He founded Central Steel Co. in 1913, later becoming its president. When this firm merged with United Alloy in 1926 he became chairman of the board of the new company, Central Alloy Steel Co. It later became a part of Republic Steel Corp. and Mr. Griffiths then served as chief of Republic's research division. He later became president of Timken Steel & Tube Co., and from 1939 to 1941 was executive vice president of Copperweld Steel Co.

Frederick A. Brechter, 53, vice president and co-owner of **Vandyck Churchill Co.** New York, died Nov. 22.

Emil Tyden, 85, inventor, died Nov. 23 in Hastings, Mich. He invented a metal seal for box cars and founded **Tyden Lock & Seal Co.,** Hastings, in 1900. He also invented a sprinkler system for fire prevention and was one of the founders of Hasting Mfg. Co., maker of piston rings.

Webster H. Kline, 70, president, **Burke Steel Co. Inc.,** Rochester, N. Y., died Nov. 18. He was a director of American Steel Warehouse Association for many years.

Carl F. Gerlinger, 73, owner and operator of **Gerlinger Carrier Co.,** Dallas, Oreg., died of a heart attack Nov. 13.

George W. Brunton, 63, president, **G. W. Brunton & Son Co. Inc.,** Buffalo, died Nov. 21. He established the machinery and machinery tool supply firm in 1921.

Alfred D. Stevenson, 53, regional manager at Detroit for **Pittsburgh Steel Co.,** died Nov. 24.

Stop Rust Without Oil or Grease

DO YOU HAVE RUST IN YOUR PLANTS?

Do your beautifully machined parts reach your customers pitted with rust? Then send for the NOX-RUST representative. He will show you how other companies in your line have solved their problems. He will recommend products and methods of application that will certainly put the *Indian Sign on your rust problems* and probably save you money to boot. Remember . . . the NOX-RUST representative is a specialist from headquarters for rust preventives.

Have you heard of the *new way of packaging parts and machines* without the use of oil or grease-type rust preventive coatings? Do you know that now you can get metal parts from suppliers that are "factory-fresh" . . . sparkling clean and free of rust or grease? *Send for this important book* of case histories that will show you how others have eliminated slushing and de-greasing problems. No obligation. No cost. It's from Nox-Rust—Headquarters for Rust Preventive products.

Are you bidding on government orders that require preservative coatings? SEND FOR FOLDER LISTING FEDERAL RUST PREVENTIVE SPECIFICATIONS AND NOX-RUST PRODUCTS CONFORMING TO EACH.

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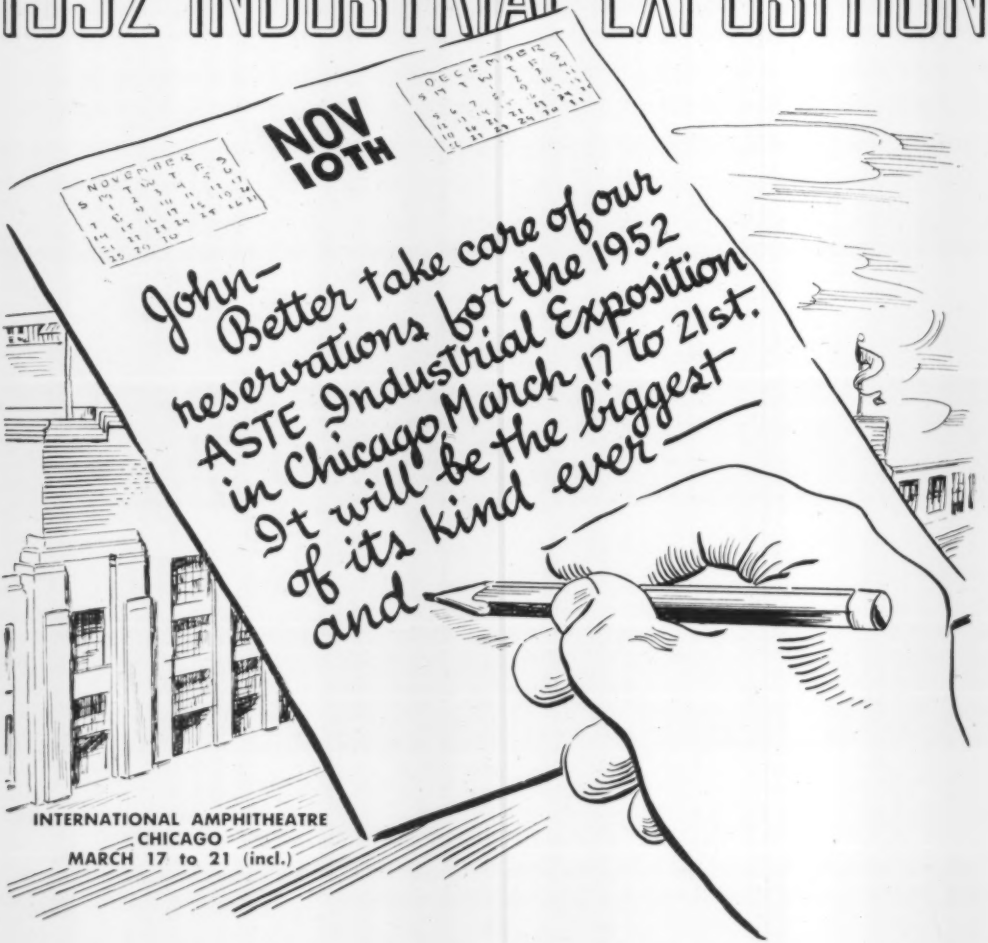
1952 INDUSTRIAL EXPOSITION


NOV 10TH
John—
Better take care of our reservations for the 1952 ASTE Industrial Exposition in Chicago, March 17 to 21st. It will be the biggest of its kind ever—
and
INTERNATIONAL AMPHITHEATRE
CHICAGO
MARCH 17 to 21 (incl.)

100,000 square feet of exhibits of the newest ideas in machines, machine controls and machine accessories, tools and gages, materials handling. Plus new tool and die materials, new manufacturing processes, new ideas in inspection methods and equipment, quality control—all designed to help you boost productivity, cut cost, improve product quality.

Five days of technical conferences, discussion panels and forums—the most important in A.S.T.E. history:

Monday—Inspection and Quality Control Day
Tuesday—Metal Cutting Day
Wednesday—Materials Forming Day
Thursday—Grinding and Finishing Day
Friday—Machine Accessories, Drives and Controls Day

Estimated attendance, March 17 to 21, inclusive—80,000.

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AMERICAN SOCIETY OF TOOL ENGINEERS
EXPOSITION COMMITTEE
10700 PURITAN AVENUE • DETROIT 21, MICHIGAN • UNIVERSITY 4-7300

Production AND Engineering
NEWS AT A GLANCE

THEY'RE GETTING BIGGER—Forging and extrusion presses larger than any heretofore built and operated in this country are on the Air Force's building program. This equipment forms large light-metal aircraft parts, eliminating the assembling of such large parts from numerous smaller pieces. Estimated cost of the program: $210 million over the next four years. Presses up to 18,000-ton capacity are now in use. Now they're talking about 75,000-ton forging presses.

AUTOMATIC ENGINE-BUILDING—Hand labor has practically disappeared in De Soto's new V-8 engine plant. Everything that moves is controlled electrically, hydraulically or mechanically. The "push-button" facility is full of automatic machine tools built by 88 manufacturers in 12 states. p. 82

RUST PROOF STEEL PLANT—Bars of magnesium buried in the earth will save U. S. Steel's Fairless Works from corrosion punishment. Tied in electrically with metallic installations in the plant, the magnesium will hold down corrosion of underground electrical cable, steel piping and structural steel. The protection is afforded by the well-known and thoroughly exploited principle that when dissimilar metals in electrical contact are buried in moist earth an electrical current is generated between the two metals, flowing from one to the other. Current passes from the more corrosive metal, causing the less stable metal to disintegrate. Flashlight batteries and electroplating facilities operate on the same principle. New bars of magnesium will be buried near the plant as the old ones decay.

FEWER POROSITY REJECTS—Porosity rejects in supposedly pressure-tight castings can be both exasperating and expensive to producers and users alike. What to do about it? Preventive impregnation of low-density metals is one answer. Preventive treatment is used for magnesium, aluminum, bronze, iron and steel alloy sand castings, permanent mold castings with sand cores and die castings slated for pressure applications. The procedure makes possible use of light-weight, thin leak-proof structural walls to carry loads under pressure. p. 88

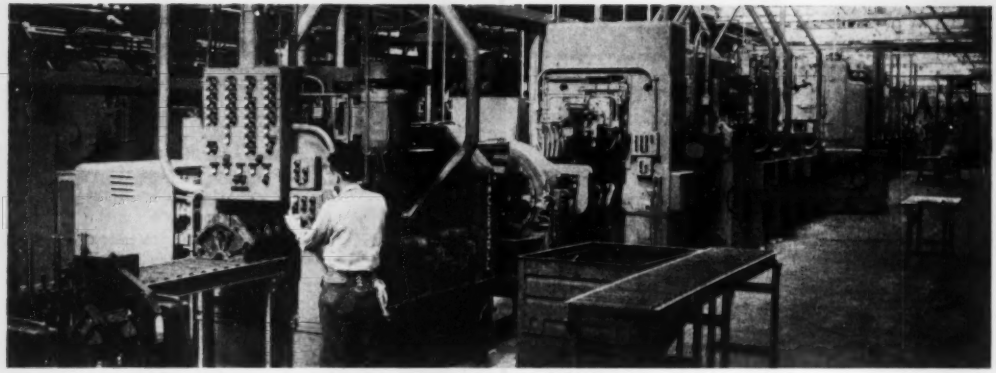
SHINIER JALOPIES?—New evidence may soon lead to the solution of a stubborn mystery: Why painted surfaces exposed to the weather get dull. A new chemical theory, that a reducing action—not oxidation—causes finishes to deteriorate, should aid chemists in trying new formulas to minimize or retard dulling of automobile paint finishes. Formerly laboratory researchers theorized that hydrogen peroxide is an oxidizing agent and that oxidation causes paint finishes to become dull with age the same way iron oxidizes or rusts. But when paint surfaces were subjected to hydrogen peroxide in tests, the dull film failed to appear. Then someone remembered that under certain conditions, hydrogen peroxide acts as a reducing agent, making oxygen withdraw from a material rather than combine with it. When the "certain conditions" were set up, lacquer and enamel surfaces dulled rapidly. Burn the textbooks and start again. But don't throw away your polishing cloth yet!

STRIP PICKLED FASTER—An acid-proof magnetic gadget sitting on the bottom of a strip mill pickling tank, is increasing output from 400 to 580 tons per turn at one steel plant. By controlling the loop of strip steel inside the pickling tank, strip can be run closer to the bottom, higher speeds used and pickling quality improved. Running the strip closer to the tank bottom puts a longer portion of strip under acid without lengthening the tank. The longer path through the acid permits faster strip speeds without decreasing time-in-acid. Hence, more production with the same equipment. p. 96

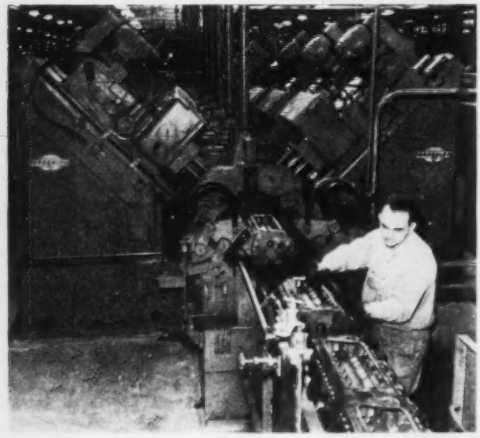
3 MONTHS' WORK IN 10 HOURS—A rapid, accurate method of testing steel alloys and other metals and plastics to find out how long they will stand up under normal loads is the latest discovery of two scientists at Rensselaer Polytechnic Institute. The apparatus makes it possible to complete in 10 hours or less an endurance limit testing job which usually requires three months or longer on costly machines under expert supervision. The method, called Dilastrain, is based on precise measurements of a material's expansion under controlled temperatures.

COBALT, BISMUTH AND SULPHUR—Radiocobalt promises to be the workhorse among the radioisotopes for medical purposes. It is readily made in the reactors; has radiation characteristics resembling radium but without some of radium's disadvantages and high cost; it has gamma radiation equivalent to a 2-million volt x-ray machine, but is easier to use; and it can be applied in needles or in other applicators for deep therapy . . . Metallic bismuth, ordinarily too brittle for most possible uses, is now produced in ductile wire and ribbon that permits its unique electrical properties to be utilized, particularly in instruments . . . Pyrites to supplement dwindling sulphur supplies is being burned in sulphuric acid and paper mills in a new type burner using a fluidizing technique like that used with fluid catalysts in petroleum processing.

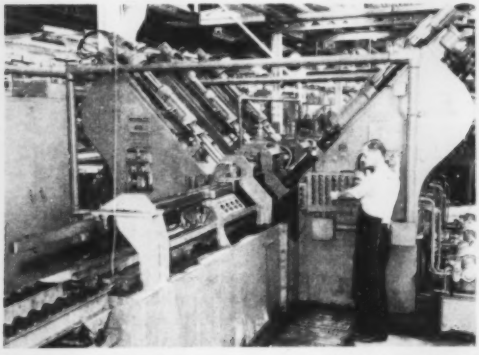
Metalworking Outlook—p. 45 *Market Outlook—p. 165*



Largest of the Ingersoll transfer machines are used for machining the V-8 engine's block. Five of these giants are located along the cylinder block line with conveyors transporting the block automatically from station to station . . .



As the block emerges from this Greenlee where the holes have been drilled to attach the heads, feelers automatically reach down to check that all holes have been drilled and to the proper depth . . .



Banks of blocks in reserve are shunted to this Micromatic hone so that its simultaneous operation on the cylinders in three blocks would not be interfered with . . .

PUSHBUTTON

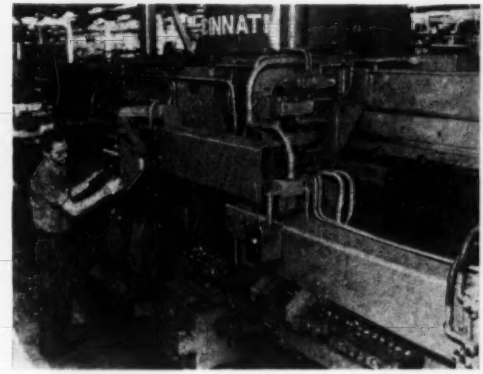
Automaticity on unrivaled

DREAM of an entirely automatic factory is closer to realization since production began at De Soto Division's V-8 engine plant in Dearborn, Mich. A monument to machine tool builders' and the automaker's ingenuity, the facility is the nearest thing to a complete "pushbutton" operation in the automotive industry.

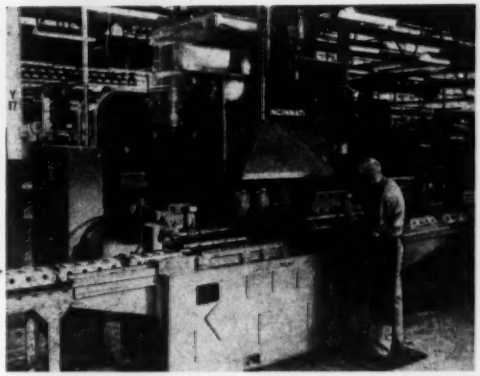
The Chrysler division began from scratch. Having no engine building facility of its own it turned to the former Graham-Paige plant on Warren Ave. which adjoins De Soto's new body plant. In designing the operation, says division President C. E. Bleicher: "We wanted a plant that would produce uniformity of parts with unfailing precision, that was the ultimate in automatic production, and that operated with high efficiency. To attain these goals we had to devise many new techniques requiring new kinds of machinery . . . We have spared nothing to make this the very finest engine plant obtainable."

In the 328,229 sq ft of the facility the company put a staggeringly large sum, reportedly $23 million, into tooling and equipment. The number of major machines contained—322 in all—would seem relatively few were it not for the fact that many are transfer type performing as many as 180 separate operations. There are 22 of these machines, five of them on the engine block line.

Common comment of visitors seeing these machines



A Cincinnati broach is moving cylinder heads into vertical position for its pass. Fast action of this machine enables it to keep pace with the more extensive milling operations which are taking place on the block . . .



Heart of the "Fire-Dome" engine is its hemispherically shaped combustion chambers which are finish-machined from their as-cast condition by this unique Cincinnati tool. Equipped with four cutters, it digs out the dish-shaped depression by rotating each tool simultaneously around two axis. Its unusual action stops machine tool men in their tracks, and marks an important departure from the machining operations required on the Chrysler engine of similar design. As block and head near completion . . .

PLANT. . .

scale used for new DeSoto V-8 engine

for the first time is: "Where are the operators?" One man stationed at a panel of lights and buttons is then pointed out as in charge of a battery of units which stretches almost as far as the eye can see. Average length of the transfer machines for the block's milling, drilling, boring, reaming and tapping operations is 84 feet. And the control panel for one is 26 feet long and 6 feet high. It has 175 starting, timing and relay controls.

The new De Soto engine is patterned along the lines of its big brother, the Chrysler FirePower V-8. This smaller engine—dubbed "Fire-Dome"—incorporates the unique hemispherical combustion chamber of that power plant, but De Soto has evolved several completely new manufacturing methods. It wisely is at work now producing engines in advance of needs so that it will have a backlog to meet the expected demand and will have service replacements from the moment the V-8 equipped car is announced early in 1952.

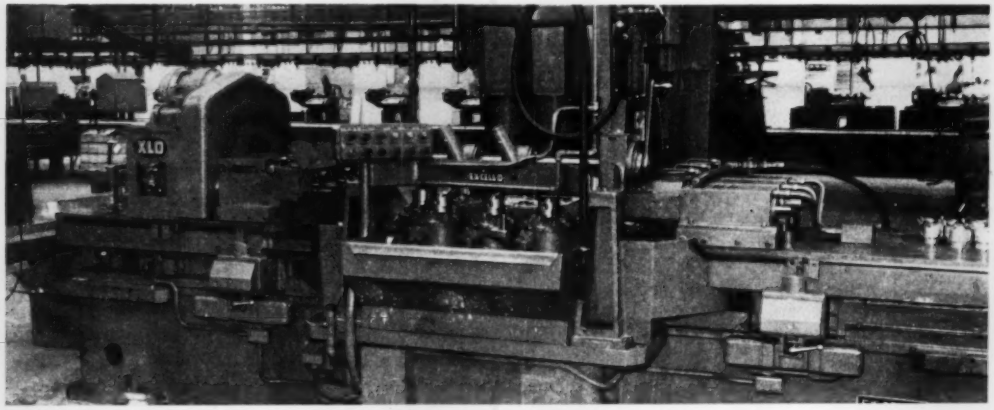
Aside from the unusualness of much of the machinery, the plant has many other interesting though hidden features. One of these is the disposal systems for metal chips. Where work is done on cast iron, a grating in the floor below permits the chips to drop onto an endless conveyor which hauls them to a hopper outside the plant where they drop into waiting freight cars. Where steel is being machined one type of soluble oil coolant is used throughout the plant, being circulated in channels beneath the floor at the rate of 2500 gallons per minute. Chips are removed automatically from large underground tanks and the coolant filtered for reuse. A third underground system is used where aluminum is worked.

Conveyorization is in many respects the key to efficient operation of the entire plant and it involves automatic systems in conjunction with nonautomatic. Between many of the transfer machines are automatic rotating mechanisms to reposition the workpiece for the next operation or to shake the chips out. Switches are provided at strategic intervals along the lines with banks of engine parts held in reserve so that any malfunction in a tool will not cause loss of production at successive tools.

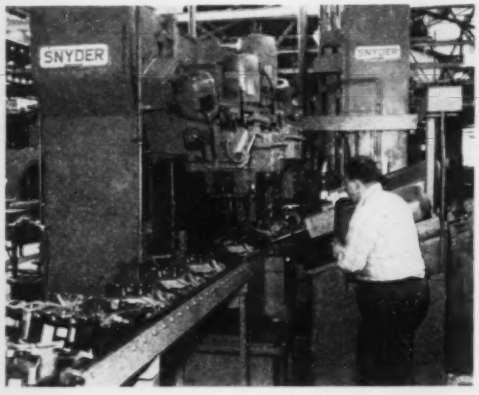
Latest type air gages are used extensively to control quality step by step throughout production. Many of these gages check several different dimensions simultaneously.

An air gage used on the crankshaft bearing bores checks the size of all five bearings and the alignment of bearings simultaneously. Similar gages are used on the main bearing journals, camshaft, piston and connecting rod. To insure dimensional control, gages are employed not only where the work is being performed, but also at final inspection.

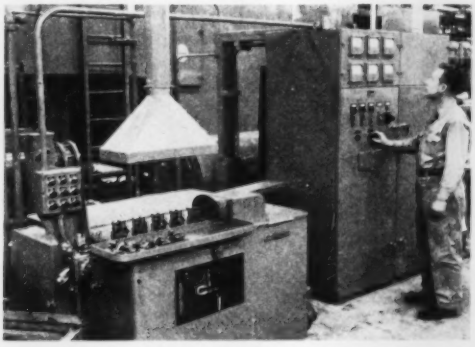
A unique gage checks valve rocker arm for proper



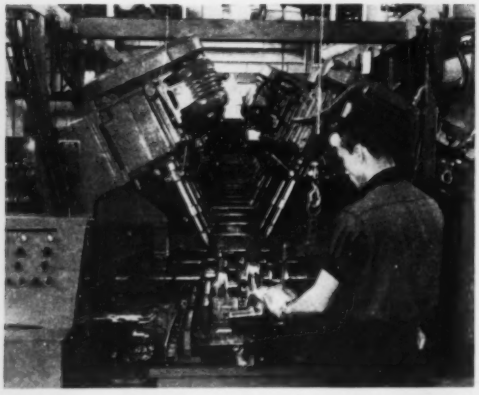
The aluminum pistons are having their skirts turned on this Ex-Cell-O tool . . .



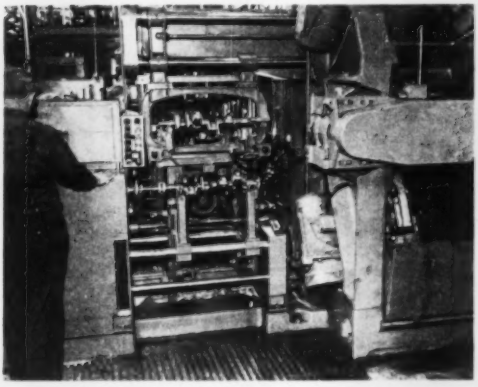
The manifolds are being drilled by this Snyder . . .



A Westinghouse induction hardener is automatically heat-treating the ends of the rocker arms . . .



A gang Snyder drill works over the crankshaft, placing 32 oil holes from several directions in this part, which when machined goes to . . .



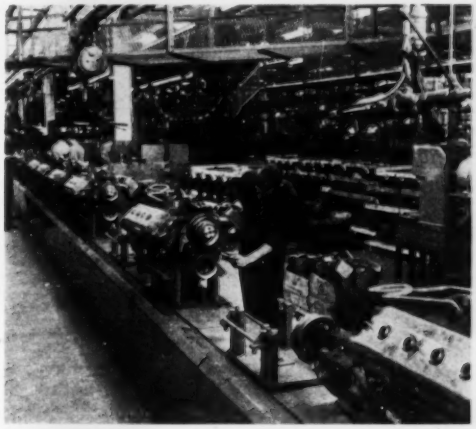
A masterpiece of precision equipment, the Dynetric balancer. Inserted in this machine, the crankshaft is automatically balanced, the machine transmitting to itself the information of where the shaft is out-of-balance and by what amount . . .

drilling of the oil supply holes. The operator loads the machine which then automatically deposits satisfactory parts in one container, rejected parts in another.

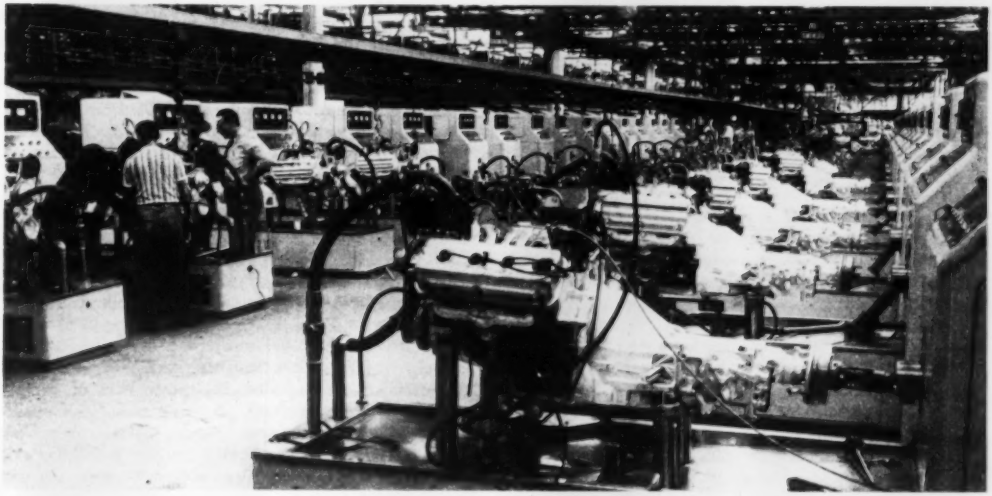
Parts such as intake manifold and crank shaft are shot peened to remove machining burrs and tool marks. This type of work was not done completely satisfactorily before, even by tedious hand work. Its importance lies in the fact that completed engines will not develop trouble later because of the presence of burrs and filings.

Every engine built in the new plant is tested on one of a battery of 36 automatic test stands before being shipped. The stands check action of engine at different speeds and under varying loads.

Air gages are used to inspect the crankshaft's five main bearing bores, the main bearing journals, camshaft, piston, and here the connecting rod. Out-of-roundness, over- or under-size can be detected immediately. This on-the-spot inspection where the part is made is backstopped by final inspection, also with air gages. Size of the cylinder bores of an engine are transmitted by teletype to the piston inspection room so that the two can be match fitted . . .



On the assembly line. Engines move along on rotatable platforms, progressing until the engine is ready for . . .



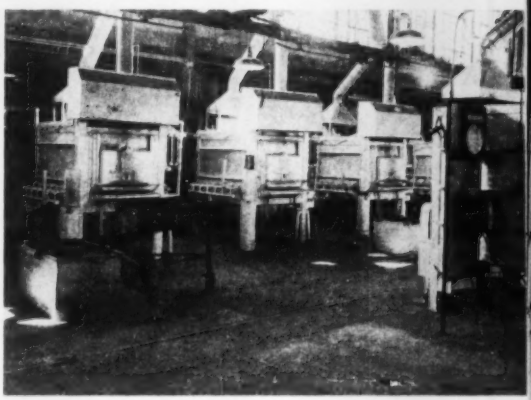
Testing. Each engine, now completely equipped and fitted with a fluid-drive transmission is given a 20-minute testing cycle on one of these 36 stands in which oil and water pressure are checked, transmission function is inspected. This is in addition to dynamometer testing in an adjoining laboratory

BATCH FURNACES

Achieve Continuous Production Rates

A battery of standard batch-type full-muffle gas-fired furnaces hardens tank tread links in quantities equivalent to a large continuous installation without major production losses due to down-time

By GEORGE BRAILSFORD
Superintendent, Douglas Mfg. Division
Kingston Products Corp.
Bronson, Mich.



CURRENT defense activities are bringing into focus again some of the never-to-be-forgotten production heat treat problems encountered during the accelerated armament program of World War II. Manufacturers are again faced with scarcities in certain critical metals and with increasing difficulty in purchasing and receiving deliveries on specialized heat treat equipment. They also face a future skilled and semiskilled manpower market that shows all signs of decreasing in potential volume. All of these factors, in the face of continually increasing demands for military production, create a situation in which it is increasingly difficult for manufacturers to obtain the tools necessary to produce the war materiel required.

Specialized Equipment a Problem — Although the heat treat processes involved in the production of critical parts for tanks, guns, and aircraft in many cases may involve hard-to-obtain, specially-designed, continuous furnaces with prepared atmosphere generation and high alloy radiant tube heating, some manufacturers are now turning to multiple installations of standard batch furnaces. A multiple batch installation in many cases will approach the operating cost of a continuous unit and also incorporate certain advantages not inherent in a specialized continuous facility.

During the World War II years, the Douglas Mfg. Division of Kingston Products Co. received a contract for the production of track link bodies for military tank treads. This contract specified a relatively scale-free hardened-and-drawn part in quantities large enough apparently to warrant the purchase of a single continuous furnace with integral quench and draw facilities. But the consideration of a continuous unit brought up the following problems:

1. A continuous unit of standard design was not available for this process. Since furnace design engineering time was at a premium then, as now, the required design time involved would seriously prolong the delivery date.

2. Alloys required for furnace components were difficult to obtain, for the furnace proper. Spare parts were practically impossible to get on the initial shipment.

3. Another factor involved furnace down-time. In case of breakdown all production would be lost until repairs were completed or replacement parts obtained. This, of course, would mean that the required production rates could not be met.

These critical factors led to Douglas management's consideration of a battery of small batch-type controlled atmosphere furnaces of standard design. These standard units could be constructed from existing designs utilizing parts already in stock. A full muffle of silicon carbide could be utilized to eliminate the use of scarce nickel alloy. With a row of batch furnaces constantly in operation and spare units available as standby equipment in case of breakdown, sustained production rates could be maintained with no danger of 100 per cent shutdown.

Continuous Production Rates — Atmotrol muffle furnaces and Forc-aire convection furnaces produced by Surface Combustion Corp., Toledo, O., were selected for the job. Eight atmosphere hardening furnaces with a ninth unit as standby are situated in a single line on one side of the heat treat room. The three draw furnaces are also in line directly opposite the

Discharging operation with heated parts two at a time being quenched in water

Left—View of heat treat room. Forced convection draw furnaces in foreground, muffle hardening units in background

hardening furnaces with their swing-doors facing away from the muffle furnaces.

Water quench facilities are located within easy reach of the muffle furnaces. One quench tank serves two hardening furnaces. Track link bodies of several designs, but of the same basic type, are hardened and drawn in this installation. End pieces of each part are forged from SAE 8640 steel. The seamless tube connecting members are formed from SAE 1035 stock. Weights of parts vary from 5½ to 11 pounds per piece depending upon design.

Hardening cycle involves heating the charge in DX atmosphere to a temperature of 1600 degrees over a 1-hour period and soaking for an additional 15 minutes. Temperature is automatically controlled and maintained with a minimum of over-ride. Parts are then immediately quenched in water.

After removal from the quench tank, the parts are given a ½-hour draw at 850° F and permitted to cool to room temperature in open air. A Brinell hardness of 310-360 is achieved. A 100 per cent hardness check within these limits is rigidly maintained and carried out after the draw just prior to shipment of the parts.

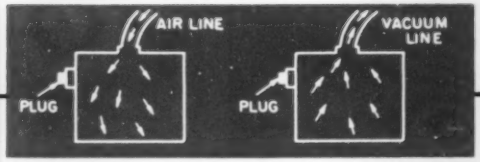
Down-Time Minimized—This facility has been processing constantly track link bodies on a limited scale since World War II and is currently operating at full production.

Only three men are required to operate the entire facility. By judicious loading and consecutive discharging and quench, all eight hardening furnaces are in operation; maximum production level is attained.

After the work from one furnace is quenched, two operators move to the next furnace, which is now ready for quenching, while the third operator reloads the first and removes the parts from the quench. The third operator, with the help of the other two, also handles the draw furnace operations.

By keeping the ninth muffle furnace as a spare, it is possible to maintain production in case one of the furnaces is down for repairs. The "down" unit is merely removed by a fork truck and replaced with the spare. Since all service connections are at a central point, the unit can be hooked up and readied for operation in a very short time.

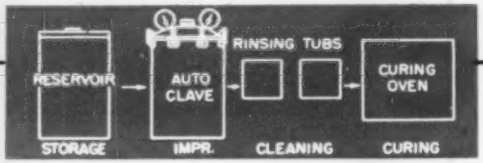
It is also possible, by careful rotation, to predict accurately when each furnace will require routine maintenance. The particular unit involved then can be removed from the line over the weekend and replaced by the spare heating unit with no loss to production.



Impregnation methods. Internal pressure, left, internal vacuum, right

Impregnation Methods Trim Casting Costs

By M. JORDAN NATHASON
President, Western Sealant Inc.
Culver City, Calif.



Flow sheet of batch immersion operations

FEW problems in the metal industry are more disconcerting than lost production and delivery lag caused by porosity rejects in castings designed to be pressure tight. Reasons for the occurrence of porosity in metal alloy castings are in general: 1. Poor casting design; 2. difference in solid solubility of the dissolved constituents at different temperatures; 3. tension stresses set up during contraction on cooling causing disruption along grain boundaries of the alloy constituents; 4. improper foundry practice and techniques.

Many castings are designed to be pressure tight. To be acceptable, they are usually pressure tested to at least 50 per cent higher than the expected operating pressure. Physical properties of most alloy castings are not affected adversely by the amount of porosity usually encountered. Consequently, they should ordinarily be usable without fear of detrimental consequences after proper impregnation.

Seals Porosity—Basically, impregnation is a method to seal porosity in castings. It would be a simple matter merely to dip a porous casting in a sealant and allow it to dry at room temperature, thereby hoping to eliminate the porosity. Unfortunately, with the progressively exacting requirements of industry which demands higher and still higher pressures and closer and more critical tolerances, such an impregnation method would be entirely unsuitable. Sealants must penetrate through the casting wall in the micropores. No build-up of residue is tolerated on machined surfaces, threaded areas, in ducts or ports.

Old timers in the foundry industry will recall that it was common practice to expose porous cast iron castings to the elements for a long time. Resultant rust and oxidation, they will say, did a good sealing job. How well these castings stood up, even to the low pressures then required, probably has never been accurately determined.

Later it was discovered that sodium silicate or "water glass" was applicable to a limited degree for salvaging low pressure parts. Its solubility in liquids and tendency to break down in the field limited its use. Tung oils were adopted somewhat later, but since its effectiveness was relatively low and its application required considerably elevated temperatures, it too became outmoded. Silicate mixed with metal powders is still available under various trade names.

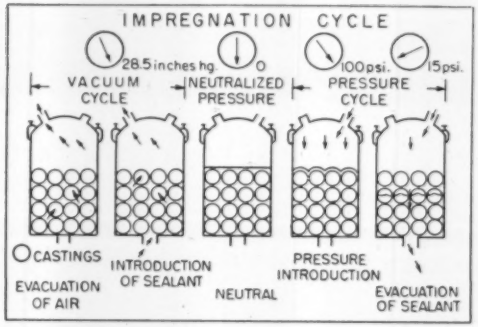
Thermosetting Resins Used—With the introduction and growing acceptance of low density metals, fostered mainly by the growth of aircraft industries, several thermosetting resins came into being. Most widely used as a salvage medium were phenolic and styrene resins mixed with linseed and castor oils. Generally they were applied to faulty castings individually, using internal pressure or vacuum. The part was cleaned and all openings except one closed. Solution then was poured into the remaining orifice and an air pressure line attached. Pressure was applied until the solution oozed through the walls. Internal vacuum

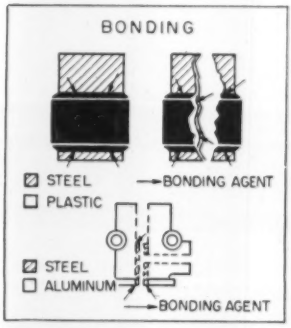
could be substituted for air and the solution applied locally to the porous area.

These were probably the first true impregnants since they were designed to penetrate the casting wall. Their greatest disadvantage lay in the fact that they are not 100 per cent solids. "Bleeding out" during curing operation often makes several impregnations necessary because of the presence of a large quantity of volatile constituents. A brownish residue is sometimes left on the part requiring further cleaning after curing.

More Low Density Metals—Since the war, use of low density metals has grown, not only in the aircraft industries but also in the manufacture of hydraulics, automobile parts, radar, electronics, etc. The ever-existing loss due to porosity led to a search for fast, easily applied sealants capable of meeting the the highest industrial requirements. Resistance to higher pressures and wider ranges of temperatures as well as solvents, chemicals, acids, alkalies, and fuels has become increasingly more important.

Operational steps to complete impregnation cycle in an autoclave





Top, phenolic plastic protector ring bonded to a roughened steel pipe where a minimum of 6500 pounds in shear is required; bottom, steel sleeve bonded to 356—T6 aluminum, both surfaces smooth. Test pressure used is 2250 psi

One such sealant contains 100 per cent solids, is a thermosetting copolymer capable of withstanding extreme pressures and temperatures and does not react with industrial liquids and gases. Its application is quick, economical and permanent. Approved by the military establishment and incorporated into engineering specifications of the major aircraft industries, the impregnant is being used as an operational step to insure against porosity in the manufacture of low density pressure parts. Treated parts show no discoloration, change in critical tolerance, nor other visible signs of impregnation. It is applicable to ferrous as well as to all nonferrous metals.

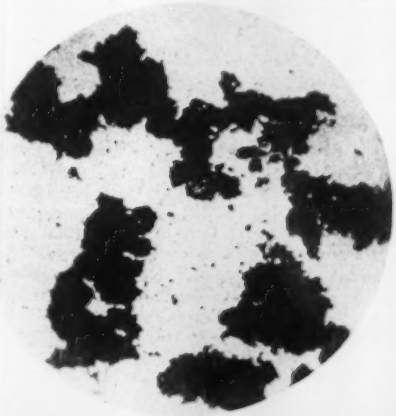
Preventives vs. Salvage Impregnation—Many alert industrial firms are discarding the old idea that impregnation is merely a salvage measure. On the contrary, it is being looked upon as a means of completely avoiding expensive rejects. Preventive treatment is recommended for magnesium, aluminum, bronze, iron and steel alloy sand castings, permanent mold castings with sand cores and die castings of all alloys where pressures are involved.

This procedure makes possible the use of lightweight, thin structural walls to carry loads under pressure without leakage. The resultant saving in weight, especially in the aircraft industry, is a singularly important feature of impregnation.

Immersed in Batches — Batch immersion now is widely used. A few to thousands of castings, dependent upon size, can be impregnated simultaneously. Parts are loaded into a dry autoclave. Air then is evacuated from the autoclave, until a vacuum of at least 28 inches is maintained for a given period.

Sealant is introduced under vacuum until parts are completely immersed. Autoclave atmosphere is neutralized and air pressure of at least 100 psi is introduced. Pressure is held for at least 30 minutes. Sealant then is returned to its reservoir, the parts drained and removed, rinsed in solvents, dried and loaded into a dry heat oven. Curing time is 10 minutes at 300° F. The amount and duration of pressure, as well as curing time used, varies with the type of porosity, wall thickness, and condition of alloy casting processed.

Operational steps required to complete the impregnation cycle in the autoclave are: (1) Evacuation, which removes all (*Please turn to Page* 110)



Left — Photomicrograph of gray cast iron, polished, unetched, X25, impregnated plunger pump section to withstand 2750 psi. Darker areas in graphite indicate presence of impregnant

By BERNARD M. AMES
Casting Development & Foundry Practice
Section, Material Laboratory
New York Naval Shipyard

Shell Molding . . . *Advantages are Numerous*

Shell molding techniques, when applied to the right job, can effect substantial production economies. From an overall cost standpoint, every job is not suited to the process. Necessary volume is a basic requirement. Design of the casting must lend itself to suitable parting and gating and heading arrangement. Possibly the most important factor is how much can be saved in the cleaning room and machine shop

SUBSTANTIAL economies are being realized on valve parts, gears and automotive castings produced by the shell molding process. One malleable foundry in the East is currently producing ammunition components in shell molds. The process definitely has its sphere of influence but it also has its limitations.

Basically, shell molding utilizes the thermosetting properties of phenolic resins to provide a bond material for silica grains in the construction of a mold. The use of urea and phenolic resins is by no means novel in the production of sand cores and molds. However, shell molding techniques are unique in that neither temper water nor additional bond materials are employed. In view of all the additives we are employing in our conventional sand mixes which ofttimes look like a French recipe, it is indeed refreshing to work with a process which utilizes a dry washed silica sand and one phenolic binder.

Investment Mixing — A conventional type muller with the wheels raised about 1 inch is most satisfactory for blending the resin-sand mixture. Pan temperature must not reach the point where the resin will flow excessively and start curing prematurely. Generally, about 7 minutes is sufficient time for mulling although additional time may be necessary if the resin is lumped. The muller should be provided with a dust hood. Wetting agents are frequently employed to minimize dusting and to lessen the tendency for resin segregation. Kerosene or liquid phenol-formaldehyde resins in small percentages (0.25 per cent) are commonly used.

One equipment manufacturer recommends the use of resins dissolved in an alcohol solution which is dripped slowly into the sand during mulling. They claim a more uniform coating of the sand grain in addition to a marked decrease in the tendency for dusting and increased resin efficiency.

Pattern Equipment — Pattern and plate materials being used principally to date are of alloy cast iron, the so-called "nonshrink" steels, and a heat treatable copper-nickel-silicon alloy. On one or two occasions we have adapted, for patterns, hand finished bronze castings which operated satisfactorily but proved to be subject to scratching, nicking or swaging to a degree not normally experienced with iron or steel.

For the most part, in our operation, we utilize cast iron patterns of the low expansion, heat-resisting type. They have yielded excellent overall performance particularly in resistance to sticking which may be due to its high graphite population on the surface. Cycling temperatures permit the use of aluminum sprues, runner bars and risers. Ribbed aluminum pattern plates and patterns have also been utilized on occasion.

Pattern plate is the heart of this process and must be well designed if production difficulties are to be avoided. The availability of the right kind of machine tools and skilled tool and die or metal pattern-making personnel is essential for manufacturing the patterns or effecting quick changes in gating and heading. Pattern plates should be ribbed and designed with uniform sections and sufficient thickness to retain the proper temperature head for setting the investment on a continuous operating basis.

Generally, rivet type heads are utilized for stripping pins and the greater the area of each head the more efficient the stripping action provided they are spaced uniformly around the plate. Stripping pins on a production pattern should of course be outside the mold cavity and equipped with springs or a mechanical arrangement for automatic return after release of the plastic bonded mold.

Gating and Heading—Sound principles of gating and heading cannot be ignored in this or for that matter any other casting process if castings free from objectionable internal defects are to be manufactured. Gating methods which provide for pouring molds on end lend themselves to the best productive arrangement for supporting the molds with a back-up material. For the ultimate in surface finish, bottom gating is essential. In malleable, choked ingates and the judicious use of dross catchers must be practiced.

From data presented by the author at the 125th anniversary meeting, Malleable Founders Society, Cleveland, Sept. 20 and 21.

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Tapering the downsprue in a ratio of 4:1 has been found very desirable.

In some of our development work we have found that shell molds are good insulators, and the thermal gradients set up in a mold are not as extreme as in green sand molds. Hence, the placement of risers and the volume of riser metal may be more critical. With the exception of the aluminum-base alloys—gray iron, malleable and ductile iron are more compatible with shell molds than with any of the other commercial alloys.

Closing Molds and Backing Up—Molds may be closed in a variety of ways. Just clamping the outside edges with spring wire is very common. However, we prefer to either bolt our molds using speed nuts and an electric torque controlled nut runner or to paste them together to minimize finning and to further reduce cleaning room costs. The mounting panel mold is one which we bolt since we do not have sufficient area for pasting.

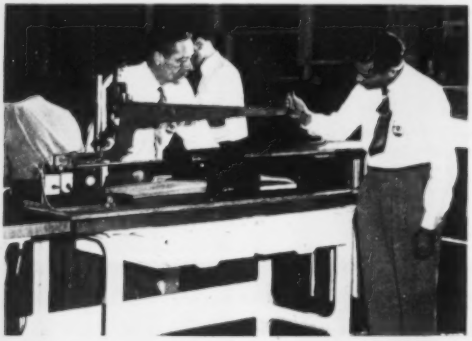
Practice here is to back molds with steel shot. Prime purpose of the backup material is to resist deformation of the mold wall and the hydrostatic head of metal pressure. Use of shot represents one of the critical material handling problems in this whole process. Such problems as overheating and cleaning fines from the shot, shot loss due to spillage, and the safety hazards involved when loose shot is on the floor in the pouring area, have not been completely or satisfactorily resolved. Whatever material is used should be vibrated during backing up and should have sufficient permeability. Permeability of the backup material is an important factor in venting gases.

Core Blowing—Hollow and small solid cores made by the shell molding process, either blown or dumped, have yielded excellent surfaces in malleable castings, much improved over conventional practice. However, cores with sharp radii require a longer flowing resin if surface tearing is to be avoided. One productive arrangement for producing cores is the utilization of heating units in the box and an automatic quick opening and closing device for the core box. Cores are cured in the core box without the necessity for a separate curing oven. Core blowing has not advanced as rapidly as moldmaking and I believe we will see a great deal of technological advancement in this area very soon.

Favorable opportunities exist for a complete mechanization of the molding system on high production runs. Perhaps one of the outstanding advantages of this process is the fact that unskilled labor may be employed. There are two basic designs involved in shell molding equipment: One in which the stations or operations are incorporated in a single, automatic molding machine and the other is a typical loop with separate stations for moldmaking, curing, stripping, coating the pattern with the mold release agent and preheating. The former setup utilizes one single pattern plate while the latter evolves around several pattern plates for continuous operation. In the loop system a dutch type oven either electrically or gas-heated with temperature control and with variable belt speeds is satisfactory for curing and preheating. Dwell time in the molding operation of course will determine the rate of production. Some systems use an overhead dispenser in the molding operation while others use the conventional mold inversion technique.

Metallurgical Findings—To date we have found that in the aluminum base alloys, and bronzes, physical properties and internal soundness are comparable if not slightly superior to green sand practice. The same trends have been noted industrially for malleable and ductile iron.

Gage Checks Tube's Wall Thickness



SPEEDING tube wall thickness tests, Fairchild Engine & Airplane Corp., Hagerstown, Md., uses a gage developed by its quality control department for the Flying Boxcar program. The electronic device checks straight and tapering tubes 6 feet long or more to assure maintenance of blueprint callouts and tolerances. Contact points on two horizontal arms are wired to a 100 v control box. Lower arm is zeroed on tube's inside wall and a vernier depth micrometer is screwed against the outer surface. Vernier readings are taken when current passes through the arms

Synthetic Lubricant Approved

Synthetic lubricating oil for gas turbine aircraft engines is a result of the combined efforts of the Navy, Air Force and industry. The new oil is applicable to both turbojet and turboprop engines, being capable of withstanding operating temperatures ranging from minus 65°F to 500°F. At the lower temperature it is one-third as viscous as the best petroleum base product and at the upper limit it is one-twentieth as volatile, thus will not boil off.

The oil is not intended for reciprocating engines and is not expected to replace petroleum products except where miiltary application requires its lubricating characteristics. High cost and relatively short supply are expected to prevent widespread commercial use.

Base of the new lubricant is one of a class of chemicals known as aliphatic diesters. To the base is added phenothiazine, to prevent oxidation at high temperatures. A third chemical, tricresyl phosphate, helps to prevent gear wear. The development represents the first significant application of synthetic lubricants, Naval Research Laboratory says. Other current uses are as instrument oils and as greases for commercial and military aircraft.

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CALENDAR
OF MEETINGS

December 5, Steel Kitchen Cabinet Manufacturers Association: First annual meeting, Hotel Cleveland, Cleveland. Association address: Engineers Bldg., Cleveland 14. Secretary: Arthur J. Tuscany.

Dec. 6-7, Agricultural Ammonia Institute: Annual meeting, Hotel Claridge, Memphis, Tenn. Institute address: Box 3041, Memphis 9. President: E. H. Gill.

December 6-8, American Institute of Mining & Metallurgical Engineers: Electric furnace steel conference, William Penn Hotel, Pittsburgh. Institute address: 29 W. 39th St., New York 18. Secretary: Edward H. Robie.

January 8, Mining & Metallurgical Society of America: Annual meeting, Mining Club, New York. Society address: 11 Broadway, New York.

January 8-10, National Constructors Association: Annual meeting, Waldorf-Astoria Hotel, New York. Association address: 50 E. 41st St., New York. Secretary: C. B. Bronson.

January 13-15, Institute of Scrap Iron & Steel: Annual meeting and exhibit, Waldorf-Astoria Hotel, New York. Institute address: 1729 H St. NW, Washington. Executive vice president: Edwin C. Barringer.

January 14-17, American Management Association: General management conference, Biltmore Hotel, Los Angeles. Address: 330 W. 42nd St., New York.

January 14-17, Plant Maintenance Show: Convention Hall, Philadelphia. Manager: Clapp & Poliak Inc. Address: 341 Madison Ave., New York.

January 14-18, Society of Automotive Engineers: Annual meeting & engineering display, Hotel Book-Cadillac, Detroit. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

January 16-17, Steel Shipping Container Institute: Winter meeting, Pierre & Hampshire House, New York. Institute address: 600 Fifth Ave., New York 20. Secretary: L. B. Miller.

January 16-18, Southern Industrial Distributors Association: Mid-year meeting, Edgewater Gulf Hotel, Biloxi, Miss. Association address: 208 Peachtree Arcade, Atlanta 3. Secretary: E. L. Pugh.

January 17, American Coke & Coal Chemicals Institute: Western regional meeting, Congress Hotel, Chicago. Institute address: 711 14th St. NW, Washington. Executive secretary: Samuel Weiss.

January 18, Malleable Founders Society: Semi-annual meeting, Hotel Cleveland, Cleveland. Society address: 1800 Union Commerce Bldg., Cleveland. Secretary: Lowell D. Ryan.

January 21-22, Industrial Furnace Manufacturers Association: Mid-Winter meeting, Schenley Hotel, Pittsburgh. Association address: 420 Lexington Ave., New York 17. Secretary: V. P. Gopcevic.

January 21-24, American Roadbuilders Association: 50th anniversary meeting, Hotel Rice, Houston. Association address: 1319 F St. NW, Washington 4. Secretary & executive vice president: Lt. Gen. Eugene Reybold.

January 21-25, American Institute of Electrical Engineers: Winter general meeting, Hotel Statler, New York. Institute address: 33 W. 39th St., New York 18. Secretary: H. H. Henline.

January 23-24, National Industrial Conference Board: Winter meeting, Waldorf-Astoria Hotel, New York. Address: 247 Park Ave., New York 17. Assistant director, conference division: Mrs. I. E. Brown.

January 24-25, Steel Plate Fabricators Association: Annual meeting, Palmer House, Chicago. Association address: 37 W. Van Buren St., Chicago 5. Secretary: J. Dwight Evans.

January 27-31, Associated Equipment Distributors Association: Annual meeting, Hotel Stevens, Chicago. Association address: 360 Michigan Ave., Chicago. Secretary: P. D. Herman.

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Fig. 1—Acidproof magnetic pickup unit for installation on pickling tank bottom to measure loop height

Magnetic Device Improves Continuity of PICKLING LINE OPERATION

Magnetic loop control allows strip to be run closer to bottom of tank, affords longer path through acid and permits increased strip speeds. Cleaning line equipped with new control increased output from 400 to 580 tons per turn

By W. W. PALMER
Special Products Division
General Electric Co.
Schenectady, N. Y.

PICKLING line troubles at a strip mill recently called for an acidproof gadget to sit on the pickling tank bottom and tell the control system the height of the steel loop. The main complaint was that failure of dancer roll parts due to acid corrosion left the installation without automatic control of loop height. Replacement of roll parts was expensive and considerable production time was lost during maintenance shutdowns. A more accurate control would improve the pickling operations in two other ways: (1) Increase productivity by using higher strip speeds and (2) improve pickling quality by holding loop height more constant. With the initial control the strip had to run well off the bottom as insurance against scratching. A more accurate control would permit running the strip much closer to the pickling tank bottom. This would put a longer portion of strip under acid without lengthening any tanks. The longer path through the acid would permit faster strip speeds without decreasing time-in-acid. Better quality pickling would result from more uniform time-in-acid due to the closer regulation of loop position.

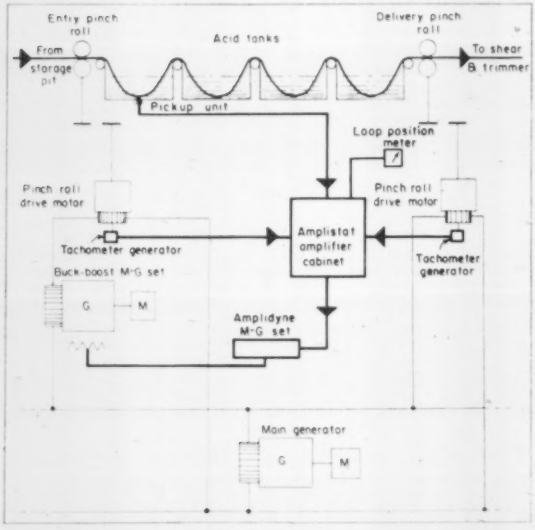
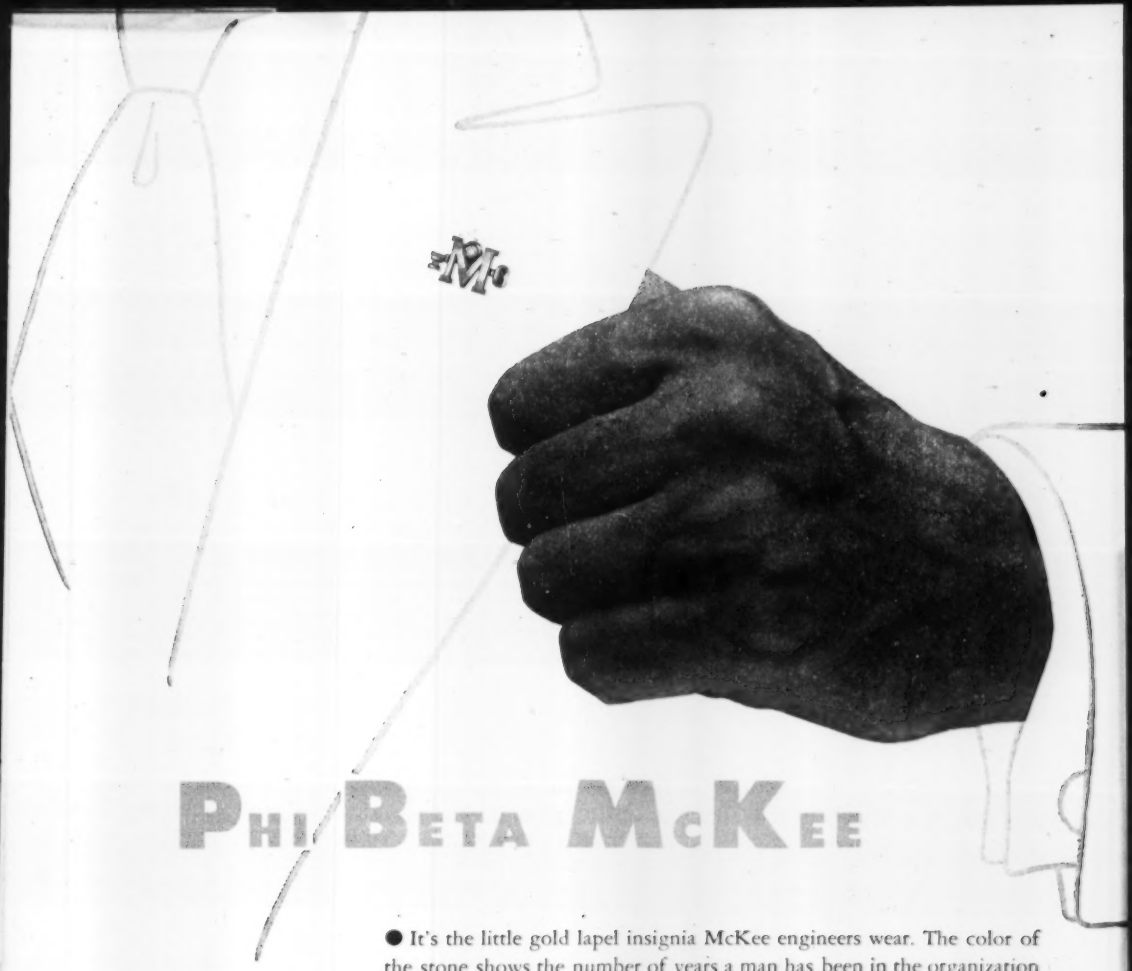


Fig. 2—Schematic diagram showing how magnetic loop control system fits into pickling line

The problem involved a control system, which would regulate the height of the loop of steel strip in the pickling tank and permit it to run close to the bottom without dragging. This problem has two parts: (1) Detecting the loop position and (2) using the position information to regulate loop position. In attacking the first part of this problem several meth-



PHI BETA McKEE

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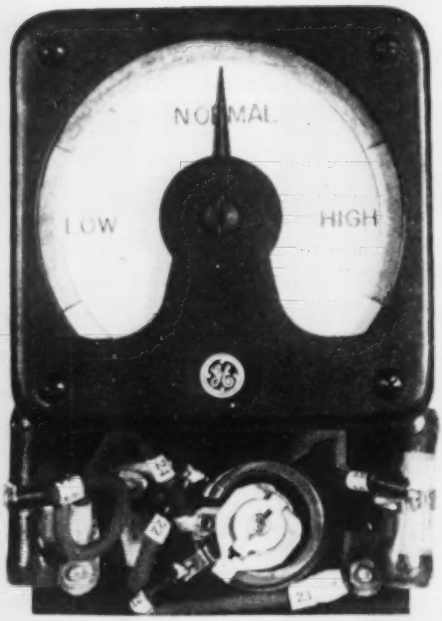

Fig. 3—Loop position meter which tells operator the height of loop

ods of detecting loop position were considered.

1. Dancer Roll—The most straight forward approach is to feel mechanically the position of the loop. A dancer roll and an arm which turns a rheostat as the roller rides up and down with the strip have been used in several installations. This method works well, until the acid destroys the roller and its supporting arm. Roller life in the acid is short. Frequent shutdowns for maintenance are expensive. This is where the acidproof gadget is needed.

2. Strip Tension—The tension exerted on the pinch rolls by the strip has been used to measure the height of the loop in the acid tank. For illustration, tie one end of a long rope to a tree and pull the other end so the center loop hangs free. The harder you pull the higher the loop will hang. So loop height could be calibrated as a function of rope tension. The most common way to measure tension is to measure pinch roll motor armature current.

This method of measuring loop position works satisfactorily, but only when the strip is stationary. When the strip moves two problems present themselves. (1) The back tension of the strip leaving the looping or storage pit fluctuates considerably, and (2) the tension due to the damping effect of the mass of acid (when the strip is raised or lowered) is a function of the rate of change of strip height and not of strip height itself. These two factors greatly affect actual tension on the pinch roll. They are not related to loop position and so they greatly reduce the reliability of tension as a measure of loop height.

3. Ultrasonics—Another method of measuring loop position is similar to sonar, the Navy's underwater detection device. It uses the elapsed time between transmission of sound waves and reception of their reflection as a measure of distance to the reflecting object. An acidproof transmitter and receiver are necessary. The steel industry might be reluctant to accept any equipment with as many vacuum tubes as the ultrasonic system would require.

4. Magnetic Method—(The acidproof gadget) Since a satisfactory acidproof detection device could not be found, one had to be developed. The magnetic properties of the steel strip suggested detecting its position magnetically. So the magnetic pickup unit shown in Fig. 1 was developed. It consists of a long, closed, 2-legged magnetic core on which is wound three separate windings. On each leg is a winding excited with alternating current. The third winding encloses both legs and is excited with direct current. Most of the dc flux is leakage flux and therefore greatly influenced by the proximity of magnetic material such as the steel strip. The degree of saturation of the iron core depends on the proximity of the steel strip. The impedance of the ac coils depends on the saturation of the core, hence the current in the ac coils is proportional to the proximity of the steel strip to the pickup unit.

In short, magnetic flux in the iron core is a function of the distance to the steel strip. The pickup unit converts flux to an electrical signal proportional to the loop height and sends the signal to the amplifier. It might be said the pickup unit looks (magnetically) at the steel strip and tells the amplifier how high it is.

The core and coil assembly of the pickup unit is impregnated with a thermosetting plastic insulation and encased in a lead cylinder. The leads are brought

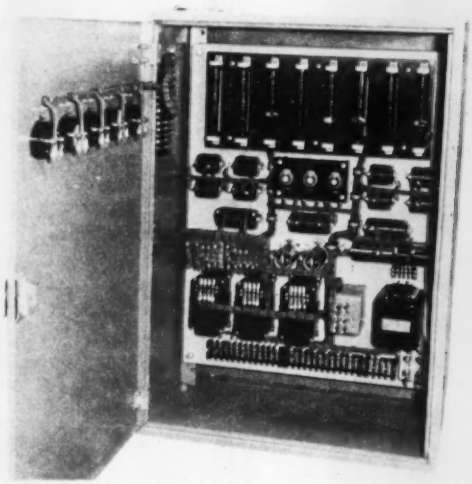

Fig. 4—Amplistat amplifier—the brain of the magnetic loop control

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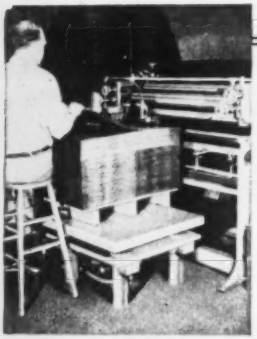

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out through a lead pipe and the entire assembly is covered with alternate layers of Flamenol* plastic tape and glass tape which are baked in position to afford additional protection against acid corrosion. Several of these pickup units have been operating in pickling acid for over two years. They show no signs of corrosion and no change in sensitivity or operating characteristics.

The Brain—Now that the pickup unit acts as an eye to see the loop height, a brain is needed to decide what to do about regulating that height. Every automatic system must have a brain. The brain senses the situation, decides what should be done, and tells the working part of the system what to do. For example, a simple thermostat as the brain of a heating system performs these functions. The brain of the magnetic loop control is the magnetic amplifier.

The amplifier, shown in Fig. 4, is essentially a 2-stage magnetic amplifier using special G-E amplistats as the amplifying components. Amplistats are used as dc amplifiers because of their characteristics of stability, long life, simplicity and high dependability with little if any attention. In the amplifier the loop position signal from the pickup unit is amplified and compared electrically with a voltage reference. This reference is set during initial installation adjustment and usually no further change is necessary. The reference determines the normal position at which the control will hold the steel strip.

How the Control Works—Fig. 2 shows schematically how the magnetic loop control fits into the pickling line system. The magnetic pickup unit, in the bottom of the first tank, continuously tells the amplifier the strip height. The tachometers, one driven by each pinch roll motor, continuously monitor and tell the amplifier the speeds of the entry and delivery pinch rolls. Height of the strip above the pickling tank bottom is determined by the length of strip between the entry and delivery pinch rolls. Length of strip depends on the relative speed of the entry and delivery rolls.

This relative speed tells whether strip is entering the pickling line at the same speed that it is delivered from the line. For instance if it enters faster than it leaves the length of strip between pinch rolls will keep getting longer and it will hang progressively lower in the tank. Any difference between entry and deliv-

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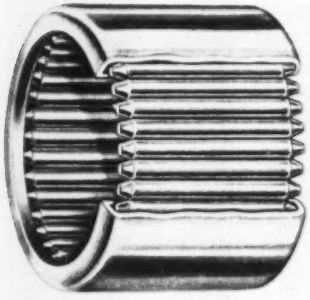
simple as . . .



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ery speed means the loop is moving up or down.

So to control strip position the relative speed of the entry and delivery pinch rolls must be regulated. Of course there must be no slippage between the steel strip and the pinch rolls. If the strip could be set at just the right height and then both sets of rolls were run at exactly the same speed, there woud be no strip height regulation problem. Length of strip between the rolls would remain constant so the height of each loop above the bottom of its respective pickling tank would also remain constant. Unfortunately the speeds of the pinch roll drive motors cannot be synchronized that precisely without a sensitive and fast acting control system. So the magnetic loop control was developed to provide the sensitivity and speed of response this job requires.

Normal Height of Loop Maintained—The delivery end tachometer furnishes a speed reference signal. The amplifier compares this reference with the speed signal from the entry tachometer. The resultant relative speed signal tells the amplifier whether the strip is moving up or down.

When the relative speed signal is zero the loop height is not changing. When the pickup unit signal is normal the amplifier uses the tachometer signals to hold the entry pinch roll speed in synchronism with the delivery end pinch roll. Thus accurate synchronization of pinch roll speed tends to hold the strip loop at normal height regardless of strip speed. The pickup unit detects and causes the control to correct for any tendency of the loop to drift up or down.

In this manner the amplifier senses the situation, decides what should be done and tells the amplidyne what changes, if any, should be made in loop position. The amplidyne adjusts the field of the buck-boost generator accordingly.

The buck-boost generator is a standard dc generator driven by an induction motor. This generator normally floats on the line. But if, for instance, the amplifier decides that the strip is too high and calls for increasing the entry pinch roll motor speed, it does so by increasing the amplidyne field positively which increases the buck-boost generator field excitation positively. This causes the generator's output to add to or boost the voltage on the pinch roll motor armature, increasing motor speed. An increase of the generator field excitation negatively would cause bucking of pinch roll

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TYPE SR—Wound Rotor Splash proof. Same electrical characteristics as motor shown above. In addition, gives adequate protection against falling and splashing liquids.

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TYPE RS—Repulsion Start Induction, Open Construction, Single Phase Brush Lifting Motor. Combines high starting torque with low starting current.

TYPE RS—Splash proof. Same advantages as open construction, plus protection against splashing and falling liquids.

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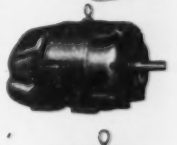

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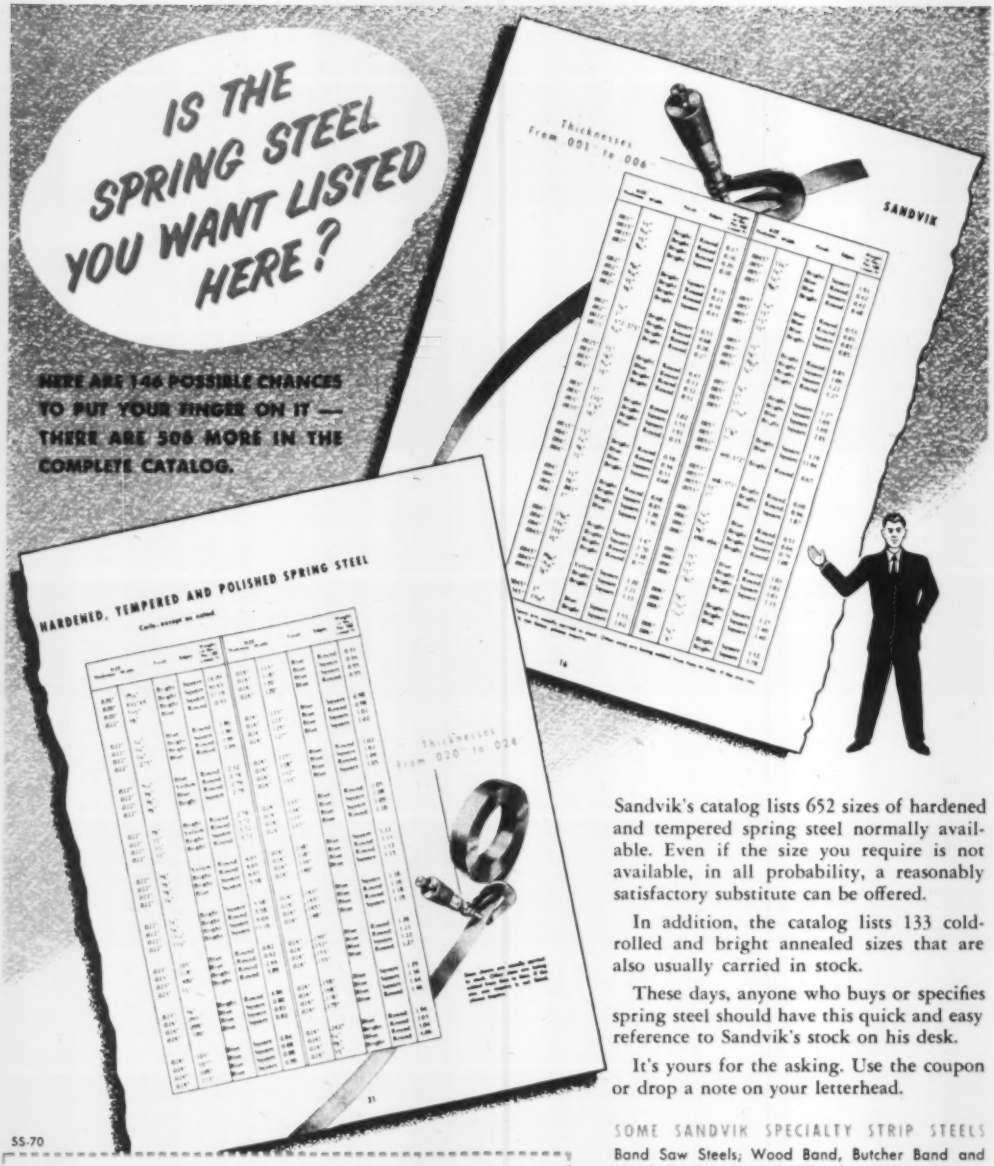

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The pickling line operator does not have to make any adjustments or even be concerned about loop height control. It is all automatic. The loop position meter (Fig. 3) usually is mounted at the operator's control desk for his convenience whenever he wants to know loop height.

Dependability, accuracy, long life and minimum maintenance under steel mill pickling line conditions were prime considerations in designing the loop control. The pickup unit and amplifier have no moving parts, relays or vacuum tubes. Parts with limited lives were not used. Amplistat magnetic amplifiers make this long lived design possible.

The pickup unit and amplifier are the only parts especially developed for the loop control. The tachometers, loop position meter and amplidyne are all standard catalog items.

Eight magnetic loop controls have been installed, one is being installed and several more are on order. Those installed are: Four at U. S. Steel's Gary Sheet and Tin Works; two at Jones & Laughlin Steel Corp., Pittsburgh; McLouth Steel Corp., Ecorse, Mich. and Weirton Steel Co., Weirton, W. Va. each have one. Detroit Steel Corp. is installing one at Portsmouth, O. Among those on order are one each for Columbia Steel Co., Pittsburg, Calif.; U. S. Steel Co., Fairless Works, Morrisville, Pa.; one for export and others. All those installed have operated for more than ten months, without a single failure in normal operation.

U. S. Steel reports that before installing magnetic loop control on four of its pickling lines at Gary these lines averaged about 400 tons per turn. Now they average 580 tons per turn with as high as 700 tons from some lines. This production has broken all its previous records. This increase in production is due partly to higher strip speeds and partly to greatly improved continuity of operations.

The magnetic loop control system was developed to overcome several

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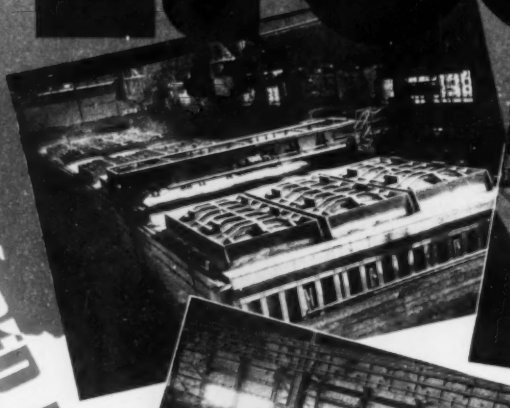

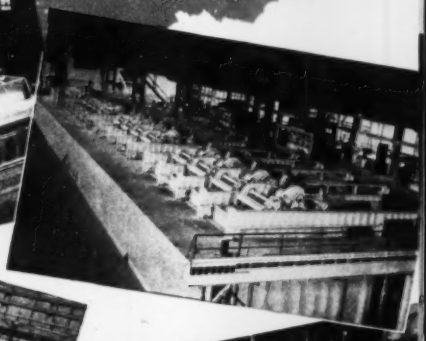

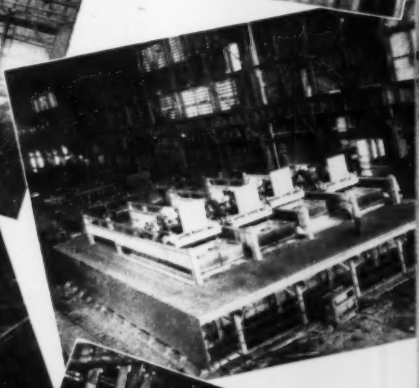

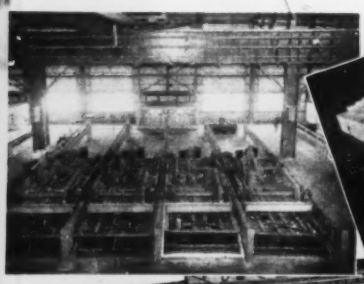

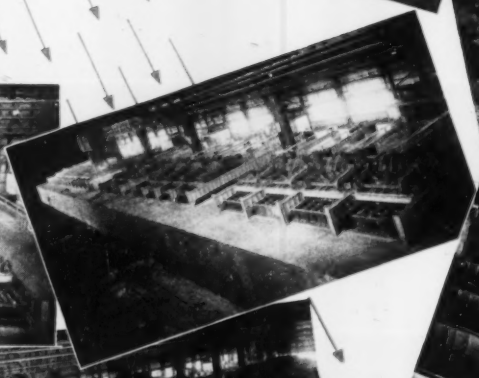

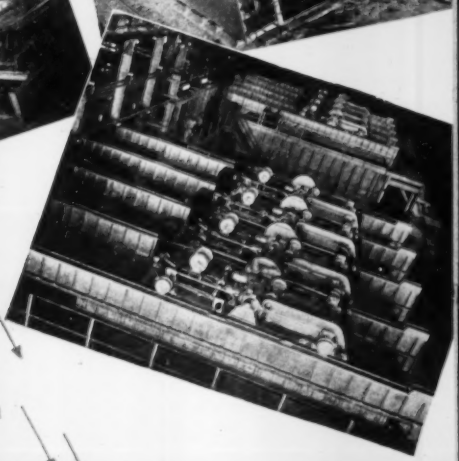

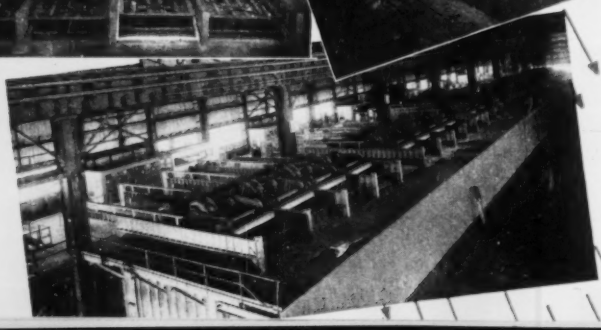

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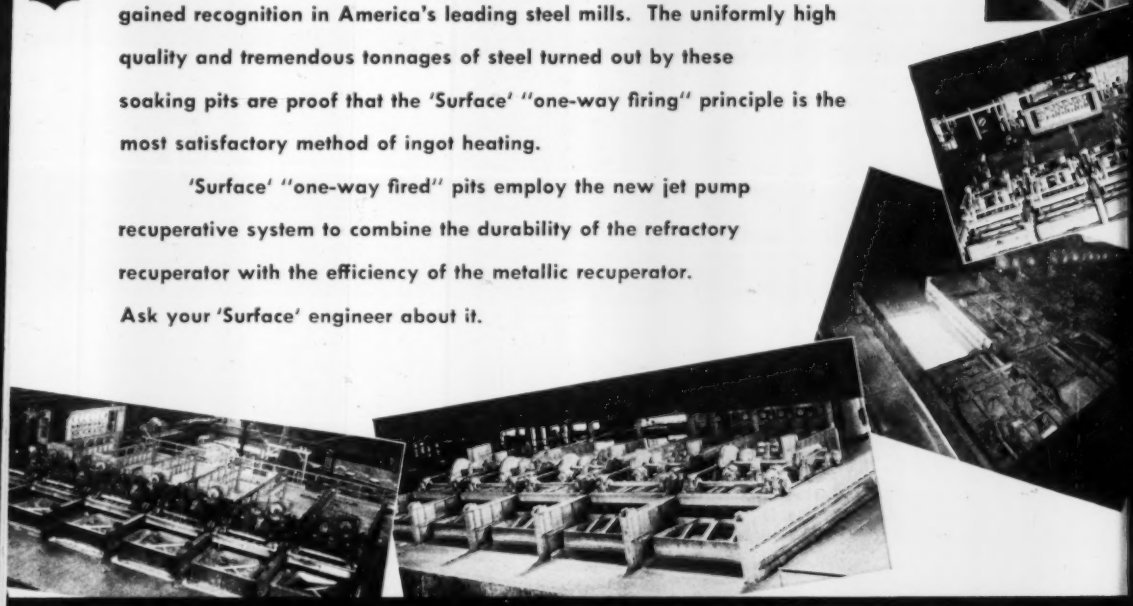

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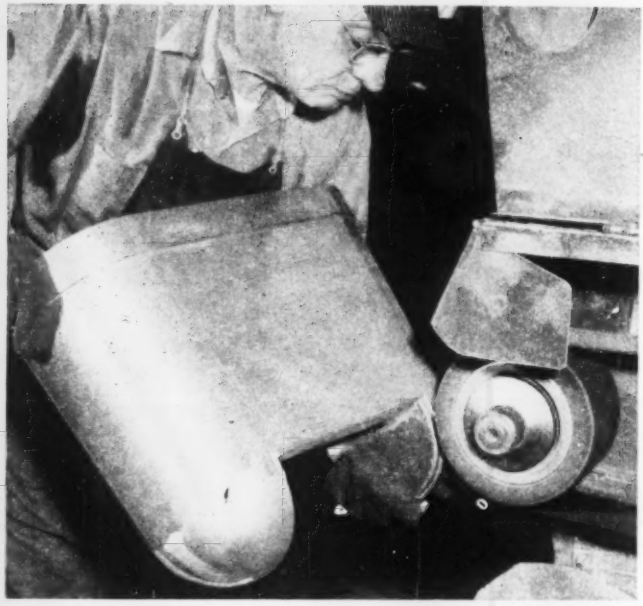

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control and maintenance problems faced on pickling lines. Long life and minimum maintenance are insured by the use of magnetic detection and amplification. Even during acceleration and deceleration the strip can be run much closer to the bottom without any danger of scratching.

Smoother control gives uniform pickling. The better control is due to the use of an all electrical system with ample power, sensitivity and speed of response. Close control of loop position, maximum steel under acid and minimum down time improve the quality of pickling, give better pickling line efficiency and higher production. This means more pickled steel of higher quality at lower cost.

Noise Elimination Explained

Problem of industrial noises and their control is the subject of a pamphlet issued by the Industrial Acoustics Co., 333 Jackson Ave., New York 54. The pamphlet illustrates the principles of noise measurement and how these noises are related to the human ear. Because noise is an objectionable sound, the elimination of these noises results in increased efficiency, improved employee morale and bettered public relations.

Types of industries that can profit from control of disturbing noises range from manufacturing and power plants to aviation factories and applies to such equipment as air conditioning systems, compressors, diesel engines, generators, jet engines, machinery, etc.

Brake, Clutch Series Announced

New series of industrial electric brakes and clutches is announced by Warner Brake & Clutch Co., Beloit, Wis. Paul Harter, the company's chief project engineer, reported success of the project at the annual meeting, Machine Tool Section, American Institute of Electrical Engineers. The units, says Mr. Harter, should increase production up to 20 per cent, lower costs through machines' increased operating speed and work capacity and cut down maintenance problems.

Among developments reported by the engineer are a combination clutch and brake for use on electric motors; a positive acting "dead man" control that stops machines if trouble develops; and an electric clutch 1½ to 15 inches diameter. Universal in application, the clutches can be used in industry where formerly only limited sizes were available.

This thickness control screw, made from STRESSPROOF steel bar, is a vital part of the asphalt road layer shown laying an air strip at a Pacific base.

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STRESSPROOF IS PLAYING A VITAL ROLE IN NATIONAL DEFENSE!

A very large proportion of STRESSPROOF production, today, is going into defense jobs. However, from time to time sample bars may be available for testing purposes.

"... as inevitable as death and taxes"

sooner or later you will switch to MOLYBDENUM High Speed Steels

It is inevitable, and fortunately, it is easy, so why not change now? This has been going on, on a merit basis, for years.

Our booklet (below) gives you all the practical facts you need to make the switch. You can save money; you will help the national effort by conserving tungsten for uses in which it is really needed. Above all, you will get a tool which is every bit as good as a tungsten type—many people think better!

All the facts you need in this FREE BOOKLET

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Please send your FREE BOOKLET
"MOLYBDENUM HIGH SPEED STEELS"

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S-12 HS-9

Impregnation Methods

(*Concluded from Page 89*)

entrapped air from the pores in the metal casting wall; (2) introduction of sealant into the evacuated pores; (3) neutralization of air in the autoclave; (4) pressure application which exerts equal force to all sides of the metal wall; (5) removal of sealant. Capillary action keeps the sealant in the pores during rinsing and cleaning of casting, prior to curing operation.

To obtain uniform results, viscosity of sealant, as well as polymerization time, must be controlled. The former is easily accomplished by a simple test with a No. 200 Fenske modified Ostwald viscosimeter, and the latter by placing a small amount of sealant in a test tube immersed in an oil bath heated to 300°F and noting the time required for the sealant to polymerize. Sealant is shipped in the viscosity (6000 cps) required for general use. Fresh solution, added from time to time maintains the required viscosity and polymerization time within a practical narrow range.

Materials Bonded—A new technique of employing batch immersion methods and sealant has been developed for bonding similar and dissimilar materials wherein extreme lateral or internal pressures are required. Plastic, neoprene, glass, ferrous to nonferrous metals, sleeves, inserts, etc., can be bonded simultaneously and at a low unit cost. Bonding is accomplished in the identical manner as impregnation. The modified impregnant penetrates between the contact surface of the parts to be bonded and forms a tough, resilient, permanent wedge.

Parts to be bonded are assembled manually or hydraulically, depending upon the tolerance involved, and put through the impregnation cycle and cured. Because the bonding agent is anhydrous and an excellent insulator, it also will prevent electrolysis from taking place at the contact surface of dissimilar metals.

Metal Stitching Explained

Technique, advantages and limitations of the metal-stitching method of fastening metals to metals and metals to nonmetals with high tensile strength wire stitches is described in "Metal Stitching—A New Technique in Fastening," published by Acme Steel Co., Chicago.

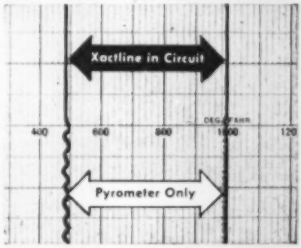
Illustrations cover: Types of loop and flat-clinched stitches; typical sections that can be stitched; the six standard clincher-die profiles; the

Automatic
"STRAIGHT-LINE"
TEMPERATURE CONTROL
with
XACTLINE

ELIMINATE
Overshooting
Undershooting

Are you going to continue to put up with that troublesome overshooting and undershooting inherent in your conventional pyrometer control—especially when it is so easy to eliminate that saw-tooth effect?

Put XACTLINE in the control circuit. XACTLINE anticipates the temperature changes—before they occur. And too, it nullifies the varying amounts of thermal lag, residual heat, and mechanical lag—producing a short on-off cycle resulting in "Straight-Line" temperature control. This performance is possible because there is no dependence upon mechanical parts—XACTLINE operates electrically.



Exact reproduction of temperature chart for a heating process showing the comparison of the "Straight-Line" temperature control produced by XACTLINE and the saw-tooth curve obtained with only conventional control.

XACTLINE is applicable to any indicating or recording pyrometer control of the millivoltmeter or potentiometer type. It should be used wherever close temperature control is required—any type of electrically heated oven, furnace, kiln, injection molding machine, and fuel-fired furnaces equipped with motor-operated or solenoid valves.

XACTLINE is a complete unit. No adjustment or coordination with the control instrument is required regardless of the size of the furnace, length of the heating cycle, or size of the load. Installation is very simple—can be either flush or surface mounted.

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four basic clincher mountings; standard and special clincher-supporting arms; head and body dimensions, limitations and specifications for both loop and flat-clinching machines; and work clearances below the work surface for flat-clinching machines.

Tabular stitching-wire data gives: Standard wire sizes (in inches and Washburn and Moen-gage sizes); tensile strengths of standard and special wires; wire ductility; standard wire finishes; and wire-size tolerances. Other tables give shear-strength values of stitches perpendicular, parallel and diagonal to line of pull; and recently-compiled maximum stitchable thicknesses for 12 metals and 11 nonmetals.

Adhesives Gain in Metalworking

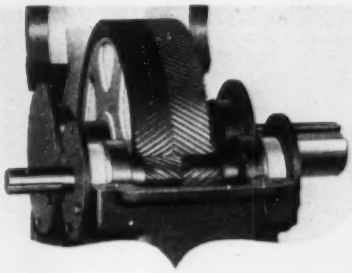
Heat resistant adhesives, widely used in brakes and automatic transmissions, are doing the job of rivets and weathering some of the roughest tests automobile parts can undergo. This was reported to the American Society of Mechanical Engineers by A. J. Kearfott and C. W. Roush of General Motors Research Laboratories, Detroit. They explained that such adhesives also are being used successfully to join or stick together both metal and nonmetal parts that require good strength and performance at high temperatures.

Because continued improvement is essential to any product, they said, further development is under way with phenolic-elastomer adhesives. Indications are that improvements in these bonding agents can be accomplished with adhesive materials in use today.

In laboratory tests on a brake dynamometer with 500 psi air line pressure for the braking action, the adhesive bond between the brake lining and brake shoe withstood temperatures, caused by friction, as high as 1021° F without failure of the bond. Even when the brake lining was worn through to the bonding surface, the bonding surface showed no signs of failure.

Heat resistant, high strength, thermosetting adhesives are suitable for a wide range of applications, since they can be used to join a variety of materials, Mr. Kearfott and Mr. Roush explained. Facing material on (automatic transmission) clutch disks varies from the cork and paper type to a metallic type facing. The adhesives also have shown good adhesion to many metals.

Two of the main adhesives used in the automotive industry are thermosetting, which remain relatively unchanged after they are cured, and thermoplastic, which are rigid at low temperatures and soft and pliable at



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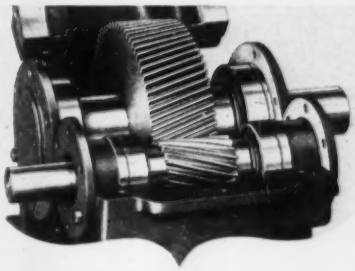

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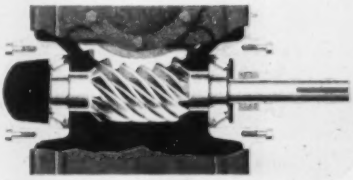

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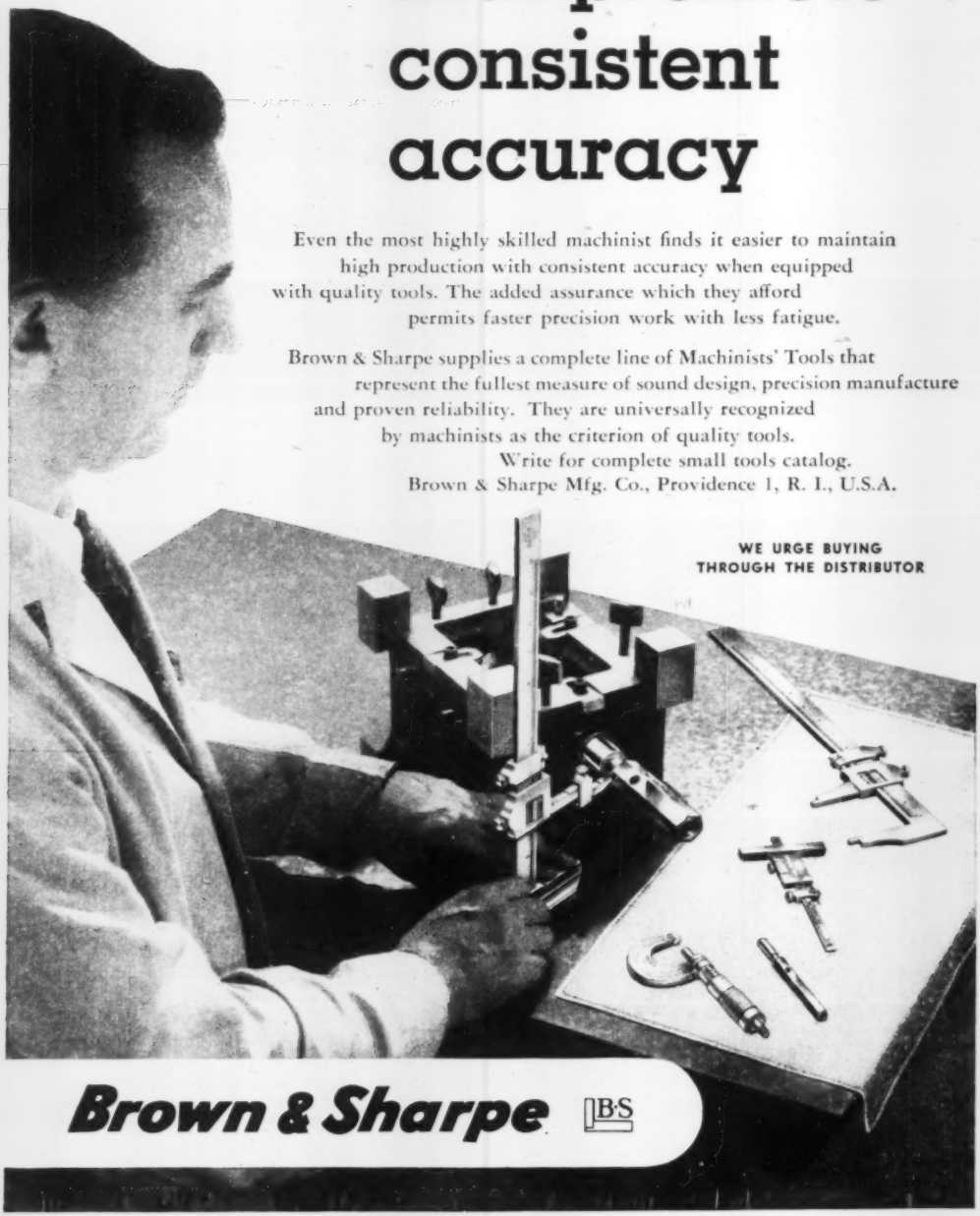


Brown & Sharpe B·S

high temperatures. Both types generally require heat to form a bond. The main difference between them is their behavior at high temperatures.

Generally adhesives are used in two forms by the automotive industry, either a tape or a cement. The tape can be cut in various widths and rolled for storage and shipment. One of the main problems with tape is its relatively short storage life, especially at temperatures over 100° F. which can occur in normal storage places.

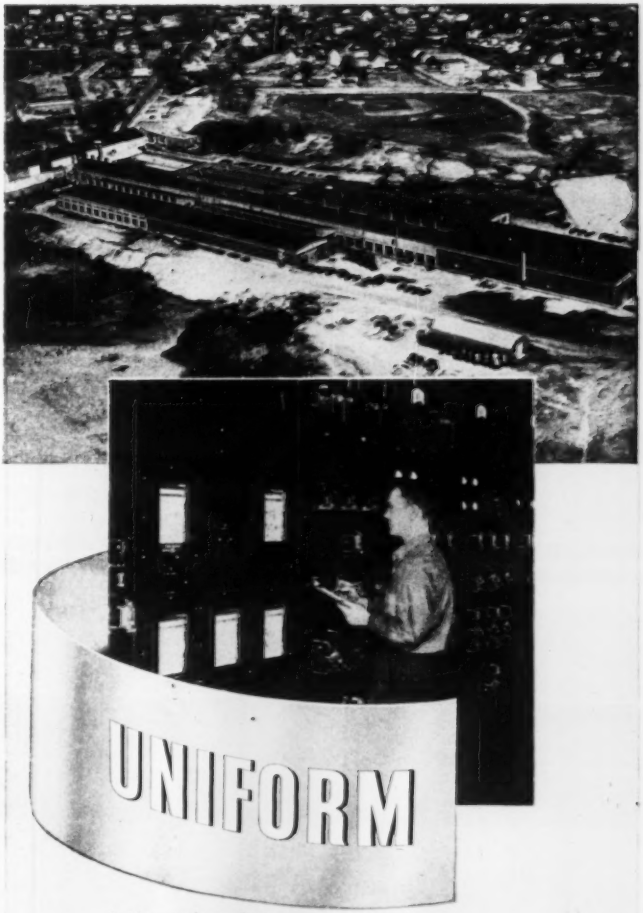
The probable explanation is that the same or similar reactions take place at the storage temperatures as do at the curing temperature, but at a much slower rate. It is a safeguard when using adhesives, especially the tape type, to maintain cool storage temperatures in the range of 40 to 60 degrees and a small inventory of uncured adhesives.

Disk Grinding Help Available

Gardner Machine Co., Beloit, Wis., has issued a booklet on modern methods of flat surface disk grinding. It is expected that the booklet will be of special interest to the metalworking industry because of the service material it provides. Each page shows an actual job on which the machine was used, describes its

Crusher Service Life Extended

REBUILDING and hardsurfacing Hadfield manganese crusher cones and mantles by Finning Tractor & Equipment Co. Ltd., Vancouver, B.C., makes them outlast the original parts. Linde Air Products Co.'s Unionmelt process is used to apply a special hard facing underlay first and then hard facing rod is used for the overlay. The crusher part is given a preheat to 150-200°F as the first step and followed by welding, making certain temperature is kept below 500°F. Photo shows the application of the hard facing base material



In this modern plant
skilled craftsmen, modern equipment and scientific controls all combine forces to produce strip steel of consistently uniform quality. Wallingford uniformity means that gage, temper and surface are in all ways and at all times the same. Edges are always smooth and straight, surfaces uniformly clean and flat, widths consistently exact. This uniform quality means savings in preparation time and smoother, faster operation to cut down machine stoppages and minimize rejects.

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Machined Pinion, ready for installation.
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The high cost of machining a stub axle pinion like this makes it imperative to *start* with a blank that is free from flaws and completely uniform in structure.

That's why these Standard Steel Works blanks are made with such particular care. They start with steel produced in Standard's own open hearth furnaces, where the most rigid control of analysis can be consistently maintained. Forging, on one of the battery of presses or hammers, develops superior physical properties, and refines the grain structure. Heat treating in special furnaces relieves strains, and adds an important plus to service qualities. Close dimensional tolerances reduce machining time and waste.

It is always well to remember that a gear can't be any better than the blank . . . and that getting a better blank is the surest way to assure minimum machining and maximum service. You'll find Standard an ideal supplier: big enough to handle the most particular jobs, small enough to make every job a matter of personal concern.

ALSO . . .

FORGED WELDLESS RINGS FOR RING GEARS

Uniform structure permits precision machining, assures uniform strength. No welded areas to affect tooth physical properties or finish.

FORGED BLANKS FOR GEARS

Pressed die forgings for gear blanks provide the strength, toughness needed in heavy duty service. Conformity to design tolerances saves machining.

NOTICE: DESIGN AND PURCHASING DEPARTMENTS—Standard is equipped to supply pinion blanks in any size that can be worked under a hammer, . . . weldless rings up to 12 feet diameter . . . and pressed die forgings up to 50 inches diameter. Make a note to let us quote on your requirements.

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specifications, and outlines the benefits obtained from the operation.

For example, in rotary grinding of camshafts, two ends of the camshaft were ground in one operation, thus stepping up production to 1000 shafts per hour. Another application is the grinding of bathtubs, where 120 tubs can be grouped per hour automatically because of the setup which permits the grinding of three edges at one time on a transfer-type grinder. Altogether, 25 applications are presented and appraised.

Specifications are given for the type of grinding machine performing each job. The booklet is illustrated with photographs of the machines and line drawings of the parts ground. It also contains information on abrasive disks.

Alloy Cut to 0.01-Inch Scale

Application of free-cutting 18 per cent nickel-silver alloy solved a difficult machining problem for Theo. Alteneder & Sons, Philadelphia. The company received a government contract calling for special 12-inch scales, engine divided into graduations of 0.01-inch. In all previous cases where work was done on similar scales, only the first inch was required to be graduated.

Stainless steel, desirable for its durability, caused difficulty in trial runs, not only during machining the basic strip, but also in cutting the 1201 channels about 0.005-inch deep. Life of the tiny, special-alloy cutting tool, which makes an in-and-out trip through the stock to produce the groove, was very short.

Softer materials, such as brass, aluminum or plastic, were easier to work but were seriously short on durability. Also, it was found that grooves cut in aluminum were more difficult to clean. A small burr occasionally remained at the end of the cut or along the sides. This resulted in an irregular groove and hindered the next step, which involves implanting a small quantity of black pigment in the grooves to make the scale easier to read.

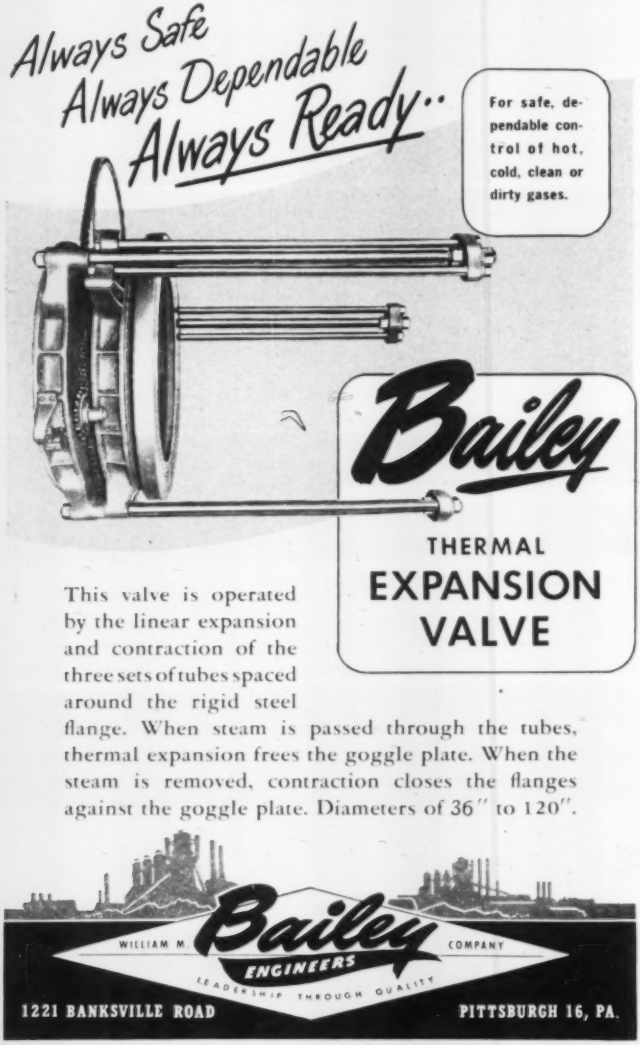
Alteneder then specified the free-cutting 18 per cent nickel-silver alloy, Riverside Metal Co.'s mixture No. 5. This mix nominally contains 65 per cent copper, 18 per cent nickel, 16 per cent zinc, and 1 per cent lead. The lead additive gives the material a relative machineability rating of 50, compared with a rating of 20 for the unleaded alloys, and 100 for free-cutting brass.

Riverside mixture No. 5 has been a satisfactory solution from several standpoints: Burrs resulting from tiny, closely-spaced cuts either break clean or are easily removed, using No. 1 emery cloth. The 18 per cent nickel alloy has desirable light color, a low co-efficient of linear expansion (.0000090 per °F.), and good durability. Alteneder reports generally no lubricant is required in cutting the grooves, although occasionally a small amount of turpentine is applied.

Bolt Tension Test Improved

A new type bolt extensometer designed for accurate tensional tests of bolts without the influence of shifting of grips or seating of the specimen, is announced by Baldwin-Lima-Hamilton Corp., Philadelphia. The instrument was developed by R. H. Pinkel, research metallurgist, International Harvester Co., Chicago, for testing the many sizes of threaded bolts required by the company. Slight refinements have been added by Lawrence Hyde, O. S. Peters Co., Washington, to provide unrestricted movement of extensometer arms.

Since the method of attaching extensometer arms to standard cylindrical specimens cannot be applied to threaded bolts, attachment has sometimes been made on the grips. Any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This valve is operated by the linear expansion and contraction of the three sets of tubes spaced around the rigid steel flange. When steam is passed through the tubes, thermal expansion frees the goggle plate. When the steam is removed, contraction closes the flanges against the goggle plate. Diameters of 36" to 120".
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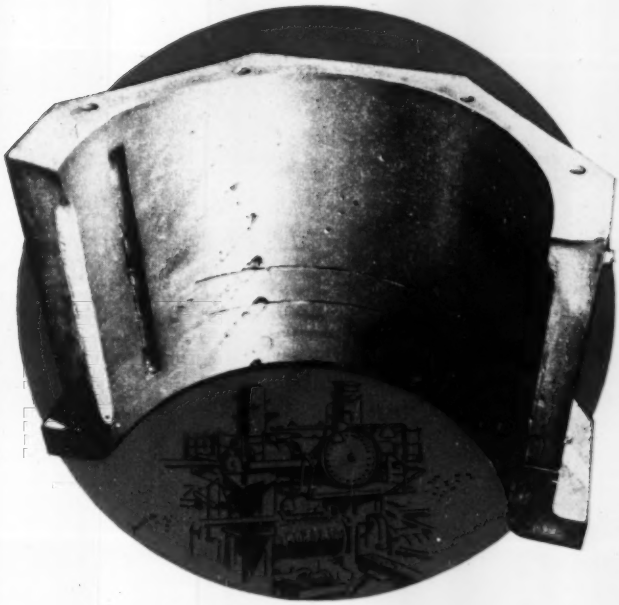

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If there's one thing tougher than rolling mill service, it's the bronze bearing above. This bearing was completely designed—from the inside out—by National Bearing Division and installed on a trial basis by one of the country's largest steel producers.

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This record-breaking performance was made possible through a special design by National Bearing Division . . . a design involving alloy, bore, grease grooves, babbitt pockets and machining procedure. And, performance of these bearings is so consistently outstanding that the same mill now standardizes on their use.

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shifting of the grips and seating of the specimen, therefore, distorts extensometer measurements. To avoid the possibility of such errors the new extensometer has been designed to contact the center of the ends of the bolt, thus making direct and exact measurements of elongation. If the extensometer is left in position until actual fracture of the bolt, a complete load-elongation curve can be obtained, showing ultimate strength and overall elongation.

Two arms of the extensometer are essentially parallel at the start of a test. The lower contact is a long thumbscrew on the end of the lower arm which is held in position by a spring. The upper contact is a hardened point in a yoke that straddles the upper loading frame and has two knife-edge stirrups that support a yoke on the upper extensometer arm. Vertical arms holding the knife edges are adjustable to cover a range of bolt lengths.

Specimen holders consist of hardened, tapered inserts fitted in box-like holding fixtures. The upper insert has a clearance hole for the bolt and the lower one is threaded. Retainer plates keep the inserts and bolts from jumping out at fracture. The extensometer is designed to operate with loading frames of 50,000-pound capacity which accommodate bolts up to ¾-inch in size.

The extensometer is of the Microformer type, employing variable miniature transformers. In operation, changing, deformation in the specimen actuates the movable core of the strain-follower transformer, which changes its output and unbalances an electrical circuit that includes a similar unit in a recorder. The resulting electrical impulse is amplified to drive a servo motor, which moves the core of the recorder Microformer, thus rebalancing the electrical circuit, and moves the recording mechanism in proportion to specimen deformation. The extensometer has magnifications of 12.5, 25 and 50 to 1.

Tables Show Shrink Decimals

Decimal equivalents for all dimensions from 1/64 to 12-inches—compensated for material shrinkages from 1/32-inch to ½-inch per foot—are included in a comprehensive book of "Shrink Table Sheets" published by Arrow Pattern & Engineering Co., Erie, Pa. Each equivalent is corrected to four decimal places, giving the engineer, diemaker, patternmaker or tool room a precision method of checking measurements that involve known shrinks in ferrous and nonferrous metal or plastic.

Page size 11x15 inches permits listing

You can pick out

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Designed to suit individual requirements, Farrel rolling mill drives and pinion stands — separate or combination units — are available in any capacity. Farrel engineers will be glad to supply full information for any specific application.

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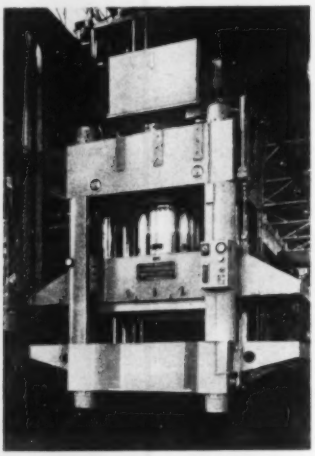
768 readings given for each shrink in clear, columnar form. One page is used for each of 17 shrinks from 1/32 to ½-inch. Shrink Table sheets are available for $1.00 each from the company, Box 823, Erie, Pa.

Corrosion Study Unit Expanded

Sea water corrosion study facilities at Harbor Island Station in the Kure Beach project, near Wilmington, N.C., are being expanded under direction of International Nickel Co. Inc. Facilities include a full-size salt water evaporator and distillation unit to study effects of water treatment and design on corrosion and scaling—especially as used on board ship. Equipment will have a boiler plant with a capacity of 4000 pounds of steam an hour.

Test unit will be housed in the present laboratory building at Harbor Island and, to replace space thus used, a two-story concrete structure will be erected on the site. First floor will be used by machine and carpenter shops and for the boiler. Second

Plate Straightening Time Slashed



COOLING under pressure in 2500-ton armor plate quenching presses like the one shown above cuts hours from the quenching and straightening time formerly required. Hydraulic Press Mfg. Co., Mt. Gilead, O., built the unit to take hot armor plate from the hardening furnace and hold it between dies while sprayed with cold water. Quenching time is less than 2 minutes for plates from ½ to 2 inches thick and subsequent straightening is eliminated. Overall bed size measuring at ends, left to right and front to back is 72 x 235 inches

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threads are strong, too

with a continuous grain flow that increases tensile strength, shear strength and fatigue life. Threads are held to close limits. All UNBRAKO Screws are being made to #3 thread tolerance —the highest grade of interchangeable screw-thread work. Write for your UNBRAKO Catalog.

Knurled Socket Head Cap Screw

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JENKINTOWN 33, PENNSYLVANIA

floor will have a meeting room accommodating 75 people and a marine museum to display specimens of wood, metals, and other materials removed from test. Additional facilities will be provided for laboratory studies of marine organisms and other biological studies.

Started more than 16 years ago, the Kure Beach project is operated by International Nickel on a cooperative basis among more than 100 companies and several government agencies. It has tested about 20,000 specimens in sea water, 25,000 in sea atmosphere, and a somewhat smaller number in sea spray.

Extrusion Die Catalog Approved

Format for the Air Force's new extrusion die catalog is approved by representatives of Air Materiel Command and the Navy Department. The catalog is being designed to provide a cross-reference engineering handbook for design, availability and interchangeability of extrusion dies used by aircraft manufacturers.

Known as "Aircraft Extruded Shapes—Aluminum and Magnesium Alloys," the catalog will be a revision of Air Force technical order No. 00-458-2. It is planned as a comprehensive reference list of extrusion die numbers for extruded shapes used by manufacturers participating in the Air Force-Navy-Industry aircraft extruded shapes program.

The need for a reference book of this type has been increasing with the stepped up heavy forging and extrusion press program. The Air Force has found it is more efficient to make large, light metal component parts for aircraft by this process than by assembling the large component from numerous smaller pieces.

Jackets Protects Insulation

Because no insulating material can withstand repeated mechanical abuse, it needs special protection at points of more than ordinary wear and tear, advises Magnesia Insulation Manufacturers Association. They add, however, that due to layout of lines or equipment—e.g., when located at floor level near stairways, ramps or platforms—it may be impossible to prevent battering of some insulated surfaces. Sometimes chains hanging from overhead chain hoists strike repeatedly against insulated lines or equipment.

To prevent such mechanical abuse, the association recommends protection with a sheet metal jacket that covers the entire area of possible damage. The jacket can be tack-welded or held in place by screws or

HERE "under one roof" at FAIRFIELD is *everything* needed for producing fine gears — metallurgical department, batteries of the most modern machines, testing laboratories, complete heat-treating facilities — all operated by skilled craftsmen working under expert engineering supervision. By specializing exclusively in "FINE GEARS MADE TO ORDER" for more than thirty years, FAIRFIELD has become one of America's largest producers of these parts. This is why many makers of construction machinery . . . agricultural implements . . . machine tools . . . military equipment . . . tractors, trucks, and buses now regularly depend on FAIRFIELD to meet their requirements. *For the Best in Gears, Specify Fairfield!* FAIRFIELD MANUFACTURING CO., 303 So. Earl Ave., Lafayette, Indiana.

FAIRFIELD

For FINE GEARS

What are metalworking thinking and planning

Dear Reader:

On Monday, January 7 we will once again publish our annual Metalworking Yearbook issue of STEEL.

As a regular reader of STEEL I thought you might like to have an advance report on how this special issue is shaping up and what you will want to look for when it reaches you.

In the 1952 Yearbook you will find four main features which will dig deeply into metalworking's present and future problems:

Metalworking's Destiny

This penetrating analysis will be published as a special insert in the YEARBOOK issue. This article will touch on some of the somber, stark realities as well as the brighter notes on the road to tomorrow when Americans expect to enjoy a standard of living many times higher than today.

What Are Metalworking Executives Thinking?

Through grass-roots interviews, in all branches of industry and government, STEEL will "listen-in" on what metalworking executives and government officials are thinking and planning. This feature will report on the metalworking industry's problems and how it expects to cope with them.

How To Do Business Under Government Controls

STEEL's Editors will report and explain where metalworking stands on various control orders affecting materials, components and equipment. This will be an extension and roundup of STEEL's weekly service on controls, and will be written with the assistance of industry men in government.

1952 Forum On Technical Progress

One hundred and fifty leading engineers and metallurgists will report on what's ahead technically. Six sections have been established to cover every phase of metalworking.

1. METALS PRODUCTION

Ores and their treatment.—Blast furnace practice.—Openhearth, electric furnace practice.—Rolling mill practice.—Pickling, annealing, etc.—Non-ferrous metals.

2. MATERIALS and COMPONENTS

Selection and specification of cast iron and steel, metals, components, etc.—Alternates and substitutes.—Design.—Metallurgy.

3. PROCESSING METHODS

Heat treating.—Machining and tooling.—Stamping and forming.—Punching, shearing,

executives for 1952?

bending.—Forging and cold-heading.—Sand, permanent mold and die casting.

4. **FASTENING AND ASSEMBLING**
Welding.—Brazing and soldering.—Riveting, bolting and other fastening methods.—Assembly methods.

5. **CLEANING and FINISHING**
Chemical and mechanical cleaning.—Chemical surface treatments.—Electroplating and polishing. — Galvanizing. — Painting, enameling and lacquering.—Metal spraying.

6. **MANUFACTURING and ENGINEERING SERVICES**
Materials handling.—Inspection and testing. —Quality control.—Plant maintenance and servicing.—Temperature and humidity control.—Lubrication.—Dust and fume control. —Safety and fire control.—Lighting.—Power and power transmission.—Miscellaneous services.

In Addition . . .

—A special article on what to expect from Washington in 1952

—How the Auto Industry Turns to War Work

—A Chronology of Events in Metalworking During 1951

—A Calendar of Meetings and Conventions Scheduled for 1952

Who's Who In the Defense Organization

A four-page fold-out insert, which will tell who to contact in Washington.

Metalworking Facts and Figures

A 48-page section presenting an outstanding compilation of statistics covering every phase of metalproducing and metalworking. They cover production, distribution, shipments, prices of metals, machinery and equipment, transportation, appliances, business indexes, employment and wages, finance, fuel, power, raw materials and construction—all conveniently indexed in detail and attractively presented in charts and tables.

We are working to make the '52 YEARBOOK the best we have ever published. I hope you will watch for it on January 7.

Cordially yours,

Irwin H. Such

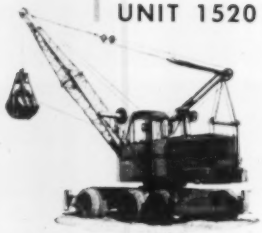
Editor, STEEL

P.S. If you are already a STEEL subscriber the 1952 METALWORKING YEARBOOK will come to you at no extra cost as part of your regular service. Additional copies may be ordered at $2.00 each.

UNIT 357

UNIT
Self-Propelled
Mobile Crane

UNIT 1520



Fits into Any
INDUSTRIAL
PICTURE!

You'll find a UNIT Mobile Crane is just the machine you need for the many material handling jobs around your plant. It's self-propelled, rides on rubber, travels anywhere. It has 1001 uses, in and out of yard. Works efficiently even in small yards where space is limited. Controlled and operated by ONE man. Powered by ONE engine. Balanced weight distribution in upper structure adds full-length stability to undercarriage. Provides full-circle, fast-cycle operation. Easy hydraulic steering. Streamlined, FULL-VISION Cab gives operator complete visibility in ALL directions. Promotes safety. Investigate these Mobile Units!

UNIT 357 — Versatile, compact, lightweight Mobile Crane, ideal for your yard lifting and loading jobs. The smoothest operating and easiest handling crane on the market. Mounted on 6 pneumatic tires, duals on rear. Capacity 10 tons. Ask for Catalog L-301.

UNIT 1520 — Heavy-duty, self-propelled Mobile Crane — another UNIT advancement in modern, high-speed, rubber-tired equipment. Lifting capacity up to 20 tons. Mounted on 12 pneumatic tires, with duals on steering axle and tandem rear axles. Ample power for the toughest jobs. Ask for Catalog 502.

UNIT CRANE & SHOVEL CORP., 6521 W. Burnham St., Milwaukee 14, Wis., U.S.A.

Crawler and Mobile models — ½ and ¾ Yd. Excavators. Cranes up to 20 tons capacity.

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SHOVELS • DRAGLINES • CLAMSHELLS • CRANES • TRENCHOES • MAGNETS

A 5997-2/3C

bolts. Where required, expansion joints with spring-loaded bolts can be used in the jacket to compensate for circumferential expansion. Longitudinal expansion is permitted by lap seams at intervals of approximately 12 feet.

Sodium Handling Illustrated

Safe handling of metallic sodium, from 1-pound bricks to 80,000-pound tank cars, is discussed in a booklet issued by National Distillers Chemical Corp., Ashtabula, O. Subjects covered in describing plant handling practices are sodium in industry, properties of metallic sodium and commercial specifications.

Tables and illustrations cover shipping methods, handling solid and liquid sodium, and cleaning process equipment. Safety precautions and first aid are followed by an appendix that gives physical and chemical properties of sodium and a bibliography. Copies of the 24-page release are available on request, from the company's service department.

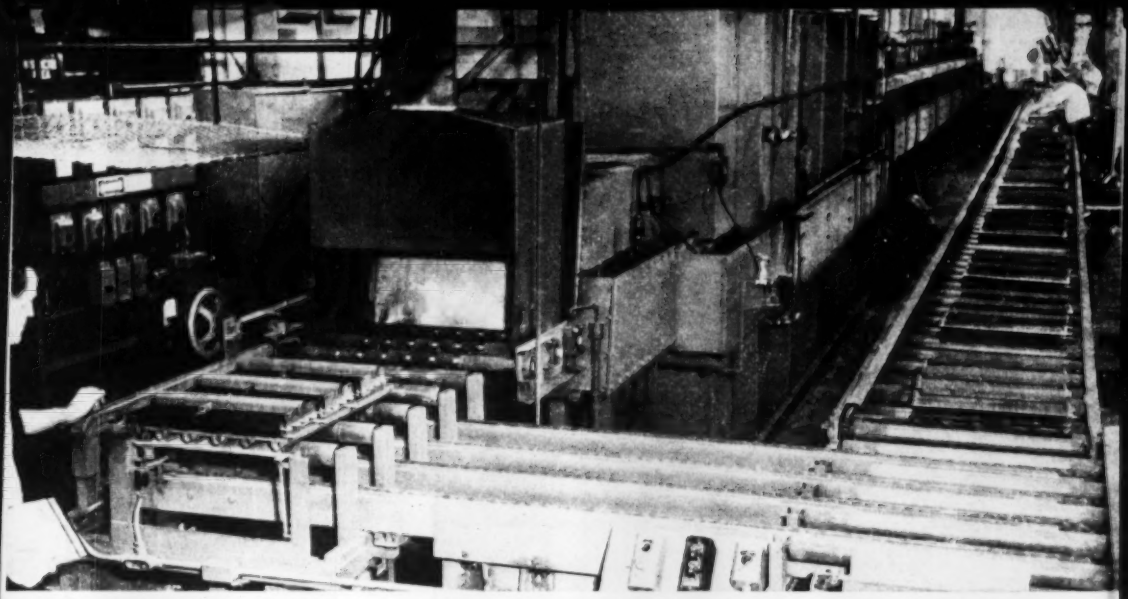
Paint Failures Prevented

A booklet describing Anchorite 100, a paint-anchoring corrosion-resistant phosphate treatment for metals, has just been published by Octagon Process Inc., 15 Bank St., Staten Island 1, N. Y. It describes in detail the common causes of paint failure and how they can be prevented. It then goes into methods of application—immersion and spraying.

A separate discussion of typical products to which the process can be applied is illustrated and includes a number of defense items. The booklet points out that it is one of the few prepainting treatments that meets the specifications for class C (type II) finish in U. S. Army specification No. 57-02C, as well as JAN-C-490, grade 1.

Fixture Servicing Safer, Cheaper

Thompson Electric Co. announced recently that installations of its disconnecting and lowering hangers in the Aluminum Co. of America's Cleveland Works, Cleveland, results in reduced lighting maintenance costs and provides maximum safety for service crews. Thompson units augment Alcoa's safety policies by permitting the servicing of overhead lighting fixtures at floor level without need for ladders, scaffolds or dangerous climbing. In addition, there are no electrical hazards for the maintenance men because the live contacts of the hangers remain overhead on the supporting structure; the

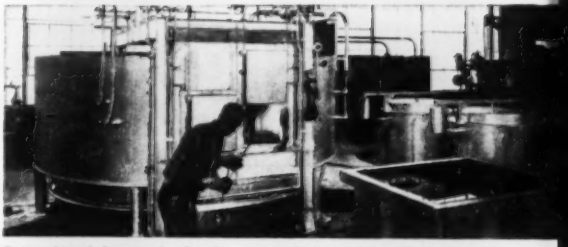


Roller-hearth furnace for high-production continuous brazing of bomb-casing assemblies, annealing shell casings and hardening and drawing jet engine parts.

Get High Speed Heat-treating for Your Defense Production

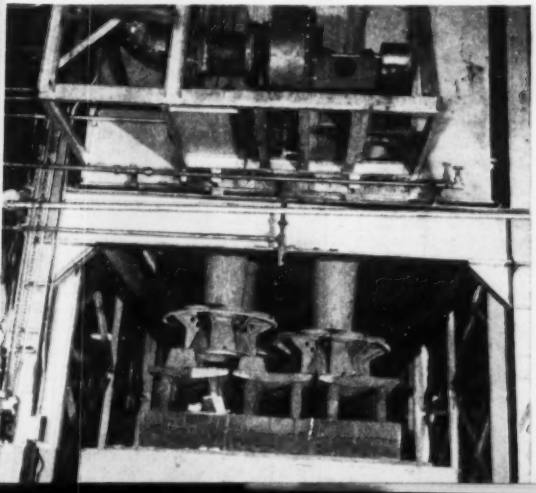
Defense equipment manufacturers are achieving fast production, low over-all cost and high quality products with dependable G-E electric furnaces. And you can benefit in the same way . . . draw on G.E.'s *tested designs* and broad experience from building furnaces since World War I . . . know that your new furnace is dependable during this vital work . . . and will serve you just as ably when you again produce civilian goods.

Present your heat-treating application to the nearby G-E Sales Office, or write to: Sect. 720-50, General Electric Co., Schenectady 5, N. Y.



Rotary-hearth furnace for heating parts which require individual handling such as hardening gears and projectiles and forging jet engine blades.

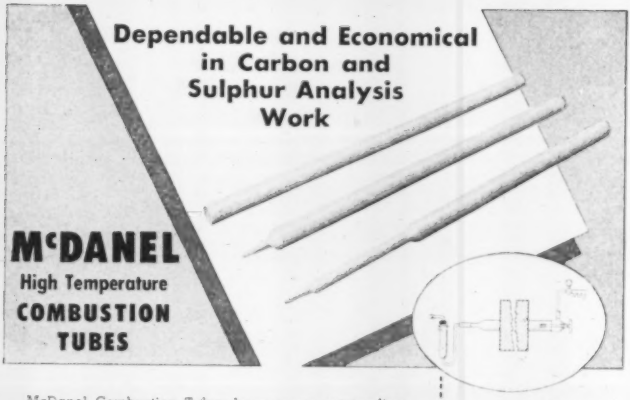
Elevator furnaces for annealing stainless steel assemblies, aluminum and magnesium parts and malleable iron castings.



Mesh-belt-conveyor furnace for accurate, automatic furnace-brazing, bright-annealing and sintering of small parts.

GENERAL ELECTRIC

720-50



McDanel Combustion Tubes have given outstanding service in America's leading metallurgical laboratories for more than 30 years. McDanel Tubes never spall or blister. They are non-porous, gas-tight and highly refractory. Precision-made in every detail, McDanel Tubes will help you keep production rolling and control costs at a minimum.

Write Today for 1951 Catalog
"McDanel Industrial Porcelains"

Refractory Porcelain Specialties in stock or designed to meet specific needs. Flasks, retorts, crucibles, etc., and parts "custom-made" to do the job that is needed.

McDANEL REFRACTORY PORCELAIN CO.
Beaver Falls, Pa.

"Fast On"
CLINCH NUTS

Speed Production
Simplify Design and
Eliminate Service Problems

Just check the sequence of operations over there to the left. The square shape protrudes through square hole and is clinched at 4 corners with swaging tool which can range from a hand tool to high speed attaching machines, depending upon production requirements. Nut cannot work loose. Thread runs to edge of nut and makes possible shorter screws, closer clearances and a more compact job.

Write for engineering data sheets on selecting and attaching FABRISTEEL "FAST-ON" CLINCH NUTS. You'll come up with some answers that will impress you, because "FAST-ON" CLINCH NUTS permit use of lighter gauge stock, kick up production and reduce costs.

All inquiries handled promptly.

FabriSteel
PRODUCTS INCORPORATED
Box 4745 Redford — Detroit 19, Michigan

lowered lighting fixtures are "dead".

Alcoa is utilizing series 3000 (3-way, 4-wire) indoor type hangers with combination mercury-incandescent luminaires in the research foundry, the mechanical testing department of the research foundry and in one of the production foundries. A new installation of these disconnecting-lowering hangers will be completed shortly in another department.

Unusual Uses To Win Prizes

To help search out new and unusual applications for both Benchmaster punch presses and milling machines, M. K. Grey, general manager, is conducting a contest, with top award being a $100 Savings Bond. Other prizes include a $50 bond and several $25 bonds. All that is required from any applicant is to describe his application of Benchmaster press or mill and list the results obtained. Winners will be chosen January 12, 1952; prizes announced January 31, 1952. Applications should be forwarded to Benchmaster Mfg. Co., 1835 W. Rosecrans Ave., Gardena, Calif.

Magazine for Materials Movers

Modern material handling techniques and machines receive an extensive coverage in the current issue of "Material Handling News" published by the Industrial Truck Division of Clark Equipment Co., Battle Creek, Mich. Actual on the job photographs are used to illustrate methods of solving materials handling problems in receiving, storage, processing and assembly, warehousing and shipping.

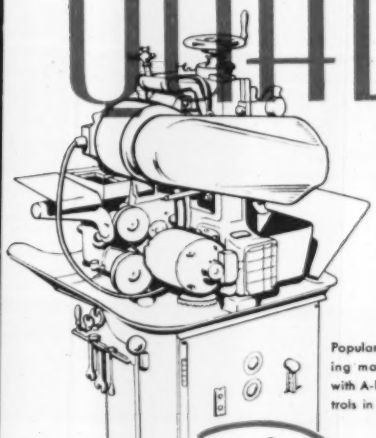
Enamel Coatings Cut Alloy Use

Further reduction of high alloys in aircraft engines, partly through application of high temperature porcelain enamel coatings, is a goal of Air Force power plant and materials testing laboratories at Wright Field. So said Lt. Col. R. A. Jones, U.S.A.F., in a talk at the annual meeting of the Porcelain Enamel Institute, White Sulphur Springs, W. Va.

Describing turbo-jet engines, he stated that new high temperature porcelain enamels which function at temperatures of 1600-1800° F under severe vibration, thermal stress and shock conditions are used widely. These coating are employed largely to protect high alloy, greatly extending service life. They are used on nearly all sheet metal parts, including tail exhaust cones, tail pipes, compression chamber interliners and directive vanes.

Discussing long range rockets, Col.

QUALITY CONTROL COMPONENTS



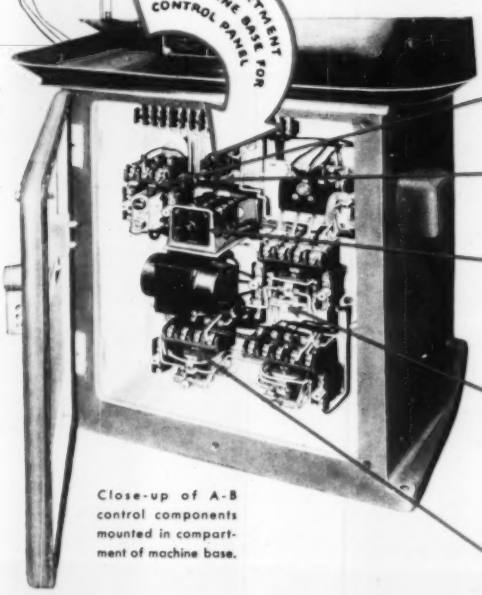
Popular milling machine with A-B controls in base.

If you design or manufacture motorized machinery, it will pay you to consider A-B controls.

These time-tested A-B control components are available in a wide variety of types and sizes. With these components, quickly selected from the A-B Handy Catalog, you can assemble control panels to provide the exact control sequence needed for maximum output.

If you have a new machine on your drawing boards, why not call in an Allen-Bradley control engineer. His advice may simplify your control design and improve your machine operation.

Allen-Bradley Controls are a Sales Asset to any Machine Tool



Close-up of A-B control components mounted in compartment of machine base.

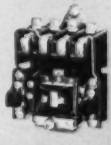
MANUAL STARTERS
Bulletin 609 Manual Starters have quick make, quick break contacts and overload relays. In a variety of enclosures.

SELECTOR SWITCHES
Selector switches and oiltight push buttons.

DRUM SWITCHES
Drum Switches for pilot control service, reversing operation, and multi-speed motor control. Furnished in enclosures.

COMBINATION STARTERS WITH DISCONNECT UNITS
These Bulletin 712 Combination Starters have a manually operated disconnect unit and a magnetic starter switch with overload relays on a single mounting plate. Can also be furnished with circuit breaker.

MAGNETIC SWITCH
The A-B line of Bulletin 709 Solenoid Starters are available in 7 sizes, 1 to 300 hp, 220 v; 600 hp, 440-550 v. All have double break, silver alloy contacts and overload relays.



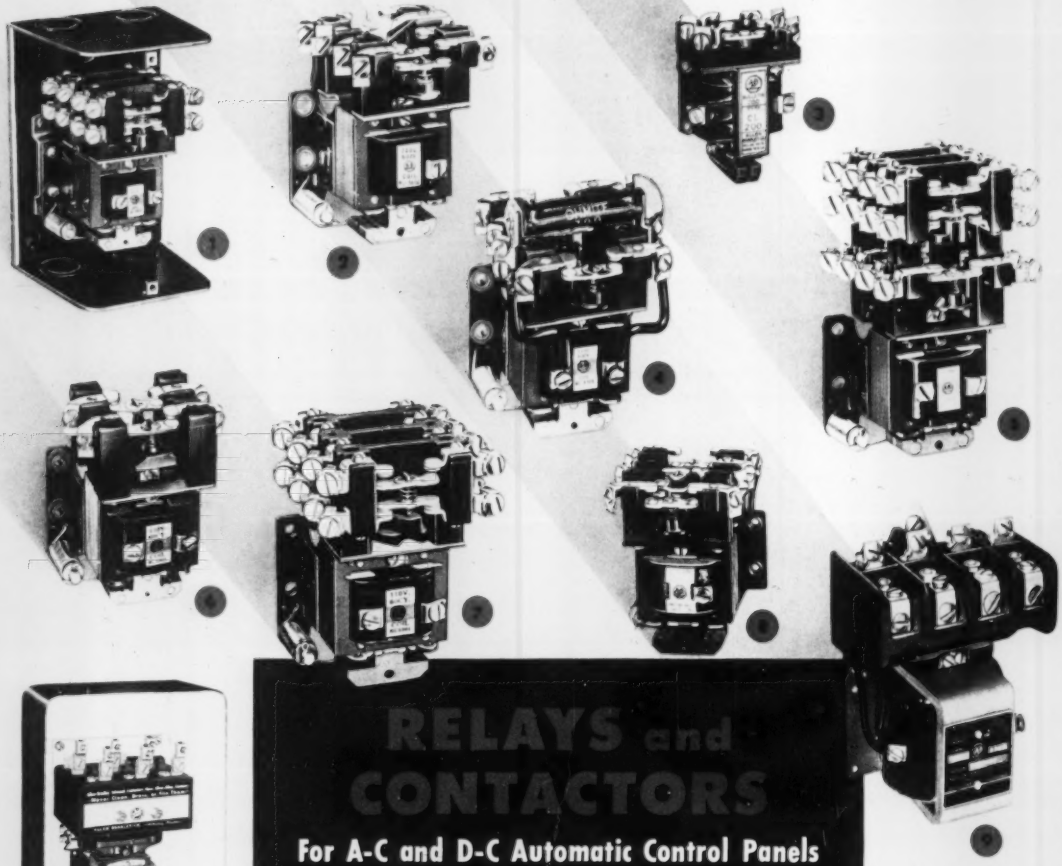
851-R

Follow the example of leading machine tool manufacturers by adding A-B controls as a sales asset to your motorized machines. Catalog will be gladly sent to you on request.
Allen-Bradley Co., 1316 S. Second St., Milwaukee 4, Wisconsin

ALLEN-BRADLEY

MOTOR CONTROL

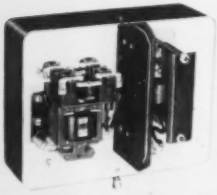
A-B Quality



RELAYS and CONTACTORS

For A-C and D-C Automatic Control Panels

Fifty ampere 3-Pole Contactor in a general purpose Type 1 Enclosure.



Bulletin 700 Type BT Relay with a step-down control transformer.

Do you need small relays from one to 8 poles . . . or contactors up to 900 amperes? Do you want hum-free contactors? You will find all of these units, and more, too, in the Allen-Bradley line . . . factory tested . . . ready to install . . . and good for millions of maintenance-free operations.

Type BX universal relays have interchangeable normally open and normally closed contacts. No reassembling needed to change contacts.

A few of the many relays in the Allen-Bradley line are illustrated above.

- Type BX Universal A-C Relay—in Enclosure
- Type BM Mechanically Held Relay—No Hum
- Type CL Low Coil Current Relay
- Type BA 3-Wire Thermostat Relay—Open
- Type BX 8-Pole Universal Relay—Open
- Type B 2-Pole A-C Relay—Open
- Type BX Universal A-C Relay—Open
- Type BM Mechanically Held Relay—Open
- Bulletin 202 2-Pole D-C 25-Ampere Relay

Write for Bulletins 700 and 200.

Allen-Bradley Co., 1316 South Second Street, Milwaukee 4, Wisconsin

ALLEN-BRADLEY

MOTOR CONTROL

QUALITY

A-B Quality

851-R

Jones pointed out that temperatures of 5000-7000° F are accorded in combination with 200-500 psi compression. Ceramic bodies, rather than porcelain enamel, are used in these extreme conditions but a large field may be opening up in the porcelain enamel coating of regenerative and cooling portions of the mechanisms. Uses were also cited in rocket power plants and aircraft rocket cylinders used in take-off assistance.

Monitor Gives Overheat Warning

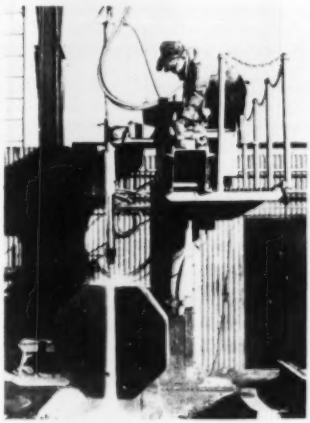
A temperature monitoring device, recently developed by the National Bureau of Standards electronic instrumentation laboratory, flashes a warning if the temperature at any one of 48 remote points rises above an individually predetermined safe value. Although the unit was developed to monitor temperature-critical points in shipboard applications, it could be used similarly in other types of installations.

From the centrally located NBS monitor unit, pairs of wires run to individual thermocouples mounted at the critical points. A master alarm light goes on if any of the 48 points become too hot, and an alarm bell will ring simultaneously if desired. The location of the trouble is shown promptly by a separate indicating unit. On the panel of this unit are 48 lights arranged in rows, each light corresponding to one of the 48 thermocouples. These lights go on to show which thermocouples (up to five) are over temperature. The actual temperature at any single point can be measured, if desired, by plugging a meter into the appropriate circuit.

Monitor covers the range from 100° to 400° F, and each circuit can be individually set to trigger the alarm at any temperature within this range. Nominal accuracy is within 4° at 100°F and within 10° at 400°F.

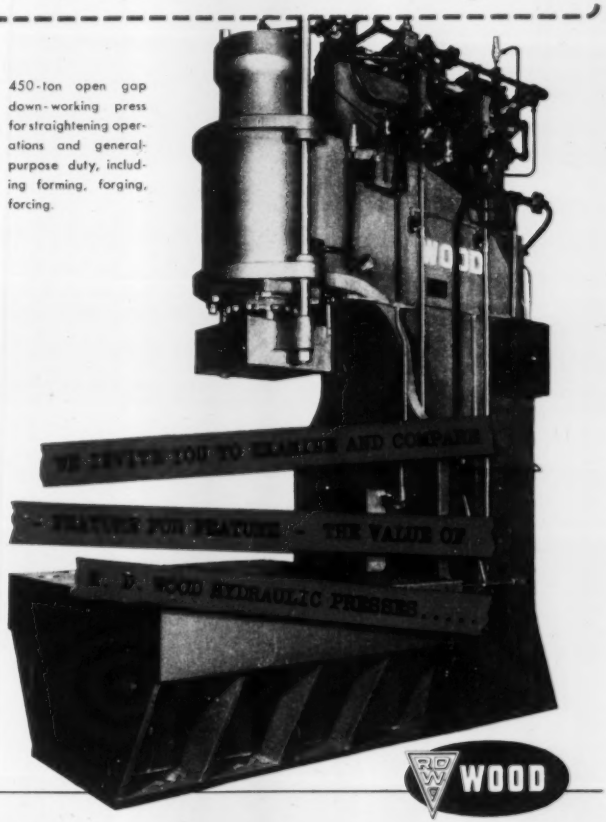
A crucial part of the NBS temperature monitor is its scanning switch. This is a mechanical assembly rotating uniformly with a 5-second period. On each revolution one section of the switch samples each of the 48 thermocouples in turn. The thermocouple signal, after application of a voltage that automatically corrects for variations in the cold-junction temperature, passes through a pulse-forming circuit and is then amplified. The amplified pulses are

Scrap Shapes Reduced to Size



RAPID, on-the-site cutting of scrap shapes once considered too big for practical reduction to furnace charging size is done with a heavy duty C-60 oxyacetylene blowpipe supplied by Linde Air Products Co., New York. Mounted on an adjustable positioning rig, the cutting setup uses an iron-rich powder that raises the oxyacetylene flame temperature high enough to melt and cut special steels and alloys. Powder cutting is also successful with the blowpipe in cutting steel mill scrap such as skulls, bottoms and spills

If it's an R. D. WOOD... It's Good*



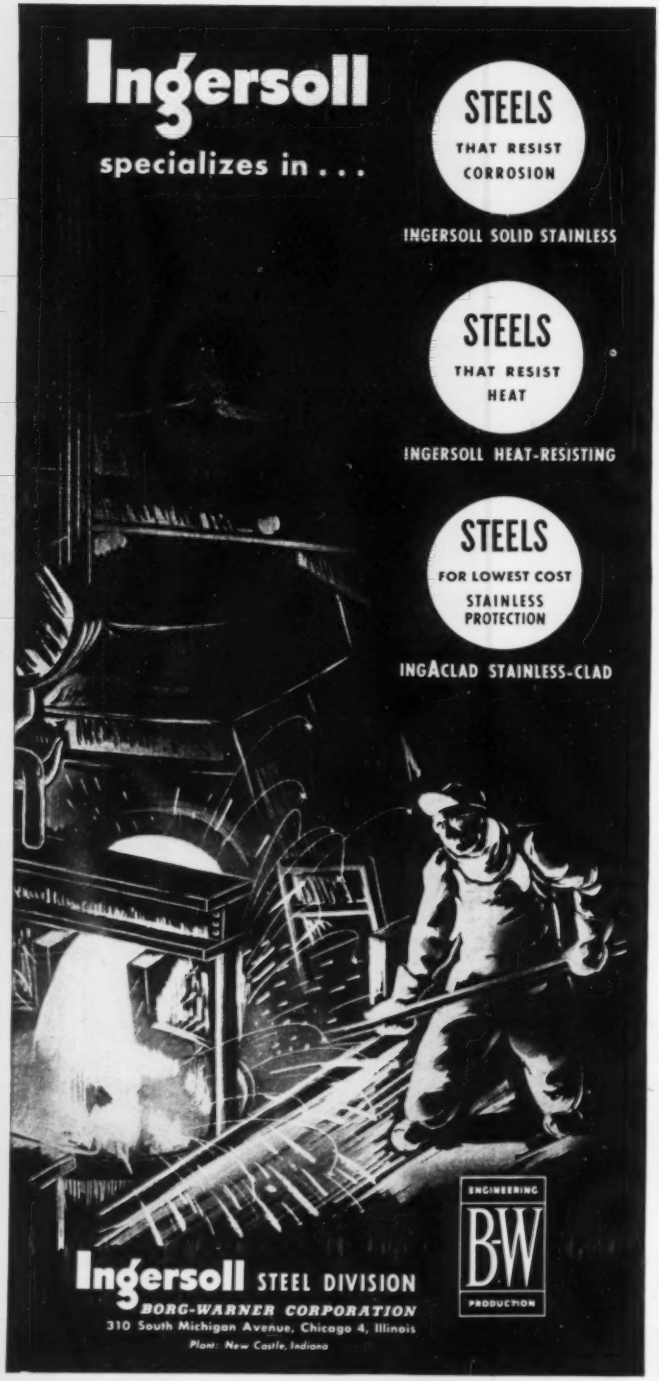
450-ton open gap down-working press for straightening operations and general-purpose duty, including forming, forging, forcing.

WOOD

HYDRAULIC PRESSES AND VALVES FOR EVERY PURPOSE
ACCUMULATORS
ALLEVIATORS
INTENSIFIERS

R. D. WOOD COMPANY
PUBLIC LEDGER BUILDING, PHILA. 5, PA.
Established 1803

*Find out why. Send for your free copy of our new photographic book of plant facilities.



fed to an alarm relay circuit, consisting essentially of a thyratron whose grid-to-cathode bias is arranged to be proportional to the desired alarm temperature. This bias arrangement is accomplished with the help of another section of the scanning switch. The required bias, individually adjustable, is inserted for each thermocouple at the time the thermocouple is switched in. Whenever the pulse amplitude exceeds the bias on the thyratron, the tube fires, closing a self-latching relay that turns on the master alarm light, and rings the alarm bell.

Proper bias voltages for the single thyratron are supplied by 48 individually adjustable alarm level circuits. When the thyratron fires on an overheated thermocouple, the discharge current flows through the associated alarm level circuit. This causes an instantaneous voltage rise, which is transferred through coupling capacitors to the starter electrode of one of 48 cold-cathode tubes, causing the tube to discharge. The 48 over-temperature indicating lights are connected in the plate circuits of these tubes so that discharge of one of the tubes lights up the proper indicator, which stays on until reset.

Sub-Zeroing Process Described

Low-temperature metal treatment is described in an eight-page folder published by Sub-Zero Products Mfg. Division, Deepfreeze Distributing Corp., Cincinnati. Among processes covered are low temperature chilling for stabilization of steel, increasing perishable tool life and shrink-fit assembly.

Two pages of technical data that show methods and results of chilling various metals and alloys are included. Standard and special models of the manufacturer's chilling machines are illustrated and described with specifications. In chilling capacity, models range to 120° below zero, removing 2000 Btu's per hour at that temperature. Copies of the bulletin, "Put Sub-Zero to Work," are available from the manufacturer at 3928 Reading Rd., Cincinnati 29, O.

Carbide Cam Shoes Cut Wear

Virtually complete elimination of wear on bronze cam shoes that had been replaced formerly about every three months has been obtained in one General Electric Co. plant. Results were achieved by brazing four standard stock blanks of Carboloy cemented carbide to worn out cam shoes for each machine.

In use for about three years, the wear-proofed cams have shown less than 0.001-inch of wear. This elim-

Machining Costs go DOWN 82%

OPERATION:
Machining 3140 and 2112 steel on automatics

SPEED:
1200 to 1300 RPM

FEED:
.003 to .004 per RPM

when Michigan valve firm switches to ANTISEP ALL-PURPOSE BASE

The former coolant cost this company $183.75 per month. When they tried Houghton Antisep A. P. Base, mixed 1 part to 20 parts water, their monthly cost dropped to only $33.00—an 82% saving in coolant costs.

This firm also reports a better finish is obtained, tool life is lengthened, and operators are better satisfied.

You'll realize how greatly Houghton Antisep Base cuts costs as soon as you start using it. Your machinists mix as much as 30 parts of plain water to 1 part of this all-purpose base. It will handle better than 90% of your metal-cutting jobs.

Use Antisep for general machining work . . . for automatics . . . for stamping and forming. You handle *one* instead of many cutting oils. You save space, write smaller inventories, simplify selection!

Why don't you ask the Houghton Man to arrange a convincing test on your tough machining operations? Or if you prefer further information in advance, write to E. F. Houghton & Co., Philadelphia 33, Pa. We'll also send you the booklets mentioned.

GET THESE NEW BOOKLETS WITHOUT CHARGE

"Houghton Defense Production Data" is a factual record of heat-treating and machining experience in processing Shells, Cannon, Small Arms, Ammunition, Rockets, etc., based on our extensive metalworking "know-how." This 52-page illustrated book is particularly valuable to plants switching to defense production. Write for your copy . . . at the same time, we'll send you the new 32-page booklet on Antisep Base, "Getting Down to Cases on Metal Cutting."

ANTISEP
ALL-PURPOSE BASE
HIGH IN ANTIWELDING PROPERTIES AND FATTY CONTENT

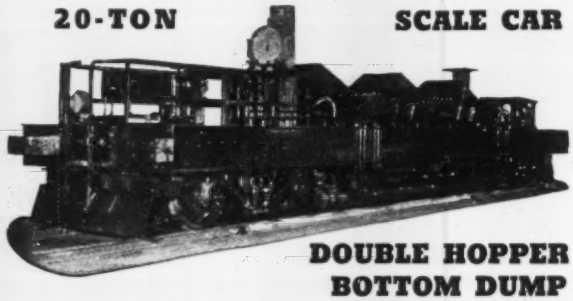
E. F. HOUGHTON & CO.
PHILADELPHIA · CHICAGO · DETROIT · SAN FRANCISCO

Ready to give you on-the-job service . . .

ATLAS
Scale Cars

DESIGNED AND ENGINEERED FOR YOUR SPECIFIC NEEDS

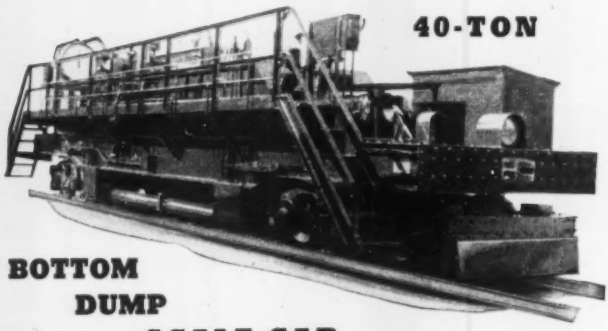
20-TON SCALE CAR



DOUBLE HOPPER BOTTOM DUMP

Car has Atlas underslung suspension scales with Atlas 24" scale Dial with chart recording. Air brakes and air-operated discharge gates. Cast steel side-frame trucks with Roller Bearings.

40-TON



BOTTOM DUMP SCALE CAR

Car has anti-friction bearings throughout, including axle mountings. Car has foot operated "Dead Man" control feature with air brakes inter-locked to apply automatically. Provided with ATLAS all-steel scales and 30" indicating dial. Type printing recorder attachment provides automatic weight registration at skip pit. All standard safety features provided including red marker lights and lights for illuminating the front of the bin.

Atlas Engineering Service is always at your service

THE ATLAS CAR & MFG. CO.

ENGINEERS MANUFACTURERS

1140 IVANHOE RD. CLEVELAND 10, OHIO

inated an annual expense of several thousand dollars for high quality bronze cam shoes, and nonproductive time required to repair and set up machines was reduced substantially. Standard $\frac{1}{8}$ x $\frac{1}{2}$ x $\frac{1}{2}$-inch blanks were silver soldered to cam shoes "as is" except for grinding to size on one dimension.

Principal Stresses Determined

A new method of three-dimensional photoelastic stress analysis has been developed by Dr. Max M. Frocht, research professor and director of experimental stress analysis at Illinois Institute of Technology, Chicago, and Roscoe Guernsey, formerly a research fellow. With the new method it is now possible to determine the actual principal stresses at any interior point of a body. Prior to this development, only principal shears could be found.

In making such a study, Dr. Frocht first machines a plastic model of the part to be analyzed. This is then placed in a special furnace designed for this purpose. The loads are applied while the plastic model is heated to a suitable high temperature and are not removed until after the model cools to room temperature. The stresses developed by the loads are in this way fixed or frozen into the model.

Model can then be sliced or sectioned without disturbing the frozen stresses. These sections, when placed in a photoelastic polariscope, reveal a stress pattern which can be observed and photographed. The stresses present at any point in a section can be studied in detail and the complete stress system, consisting of maximum, minimum and intermediate stresses can be found

Sling Users Get Assistance

Union Wire Rope Corp.'s technical and field staff has compiled a comprehensive sling handbook. It illustrates 11 sling types and covers their dimensions, weights and safe working loads. Some 30 illustrations of sling uses accompany the factual data as a help in selection of proper types. Also illustrated and detailed are 11 types of sling fittings, information on the care of slings, methods of factory fitting and packaging and information on braided wire fabric for those who maintain rigging lofts. Illustrated, step-by-step instructions for splicing the new braided wire sling fabric are included.

Combined with the sling handbook is a comprehensive riggers' manual. It illustrates and gives instruction on wire rope splicing. Study of these pages will provide the rigger with the correct methods of making, serv-

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HAMMERGANG'S SKILL
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All Parts in Erie Hammers
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Do You?

When the great, new superliner *United States* was warped out of the drydock of NEWPORT NEWS SHIPBUILDING AND DRY DOCK COMPANY she was on her way to becoming the most modern ship afloat. The latest advances of American industry were incorporated into the *United States*, the largest (990 ft. long) and fastest (30 knots plus) passenger ship ever built in this country.

Important among the advanced production processes used in construction of the vessel was Stud Welding. Aboard the *United States* KSM Solid-Fluxed Studs serve in many vital applications. NEWPORT NEWS, famed name in shipbuilding, knows well the value of Stud Welding.

Have you considered Stud Welding for **your** job? This modern method saves precious man hours in installation. And when the job is finished, the resulting weld makes a fastener that is strong and permanent in a manner that no other type of fastener can duplicate. For more information write for Bulletin 1012. KSM PRODUCTS, INC., MERCHANTVILLE, N. J.

KSM

PRODUCTS INC. ®

ARC WELDING STUDS

ing and seizing the regular and the rolled in eye splices, making an endless or long splice, splicing preformed, long lay and the Chicago splicing of eight stranded wire rope.

Data on efficiencies of wire rope attachments and illustrated direction for attaching sockets or ferrules are also included in the riggers' manual. The back cover of this 48-page sling handbook and riggers' manual is devoted to illustrations showing standard hand signals to be used in operating overhead traveling cranes, locomotive cranes and whistle signals for cranes and derricks. Sling users may secure copies by addressing: Public Relations, Union Wire Rope Corp., 2160 Manchester Ave., Kansas City 3, Mo.

Hydraulic Data Section Complete

At the recent meeting of the Hydraulic Institute in Chicago, a final draft of a new data section for the institute standards was completed. The new section will include authoritative tables on the friction losses in schedule 40 inside diameter steel pipe and in standard asphalt dipped cast iron pipe for both turbulent and laminar flow. The tables are easy to use, and an explanatory text with several illustrative examples is provided. The latest data on the loss in valves and fittings is included, and will be of widespread interest.

This new data section will also include tables on the properties of water, steel and cast iron pipe, tables for the friction loss of paper stock in cast iron pipe and recommended materials for pumping various liquids. Additional details are available from the institute, 122 E. 42nd St., New York 17.

Chart Illustrates Tool Line

Severance Tool Industries Inc., Saginaw, Mich., offers cutting tool users a 15 x 24-inch chart showing tools representing the company's line. Midget and junior mills, deburring cutters and chatterless countersinks are among those illustrated. Tinned top and bottom for office or shop posting, the chart will be forwarded on request.

Wire: Lighter, Less Costly

Handbook containing information and engineering data on design, purchase and production of wire parts or products is published by E. H. Tichener & Co. The 16-page illustrated booklet covers types of steel wire, sizes and comparison of gages, automatic forming, resistance welding, plating and finishing and lists data on treatments, threading, forming and flattening. It reports 12

THE

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COMBINATION

Layne offers you the right combination of unmatched experience plus modern equipment for installing well water supply units of any size—and for any purpose. Layne has made more water supply installations than any other firm in the entire world, and this valuable experience places Layne in a position to unquestionably do every job exactly right. Once the installations have been made, a complete record of everything is kept: strata formation, sand porosity, casing details, sand screen length, diameter and metal used, all pump information including bearings, shafting, impellers and operating characteristics. With such information, Layne is always in a position to give quick and most economical service for adjustments or repairs if and when needed.

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Layne accepts your contract for furnishing everything; Layne supervision, Layne drill crews, Layne drill equipment, Layne designed and Layne built louver type sand screen and Layne high efficiency vertical turbine pumps. No other firm is involved, therefore there is no divided responsibility. This plan gives you the very finest well water supply units that world wide experience and skill can build.

Layne offers a wide range of fully illustrated catalogs covering all phases of well water installations for all types of industry. Write for more information to

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WELLS & PUMPS

case histories of products made stronger, more attractive and less costly when redesigned with wire formings or assemblies. To obtain copies, write to the company, 65-69 Clinton St., Binghamton, N. Y., requesting "Use of Wire Construction in Product Design."

NACE on Cathodic Protection

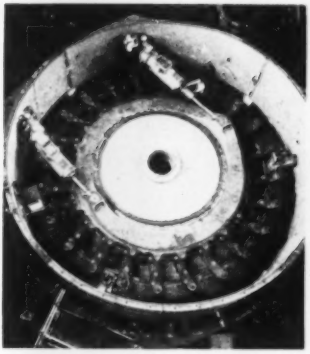
Recommendations for correlating cathodic protection systems on underground metallic structures are given in a report by the National Association of Corrosion Engineers' committee on cathodic protection. Report consolidates and revises four bulletins prepared by the committee to help solve problems created when adjacent underground metallic cables, pipe lines and rail track are protected from corrosion by applied cathodic currents. Copies can be obtained for 50 cents, by writing the association, 919 Milam Bldg., Houston.

Copper Saved by Cladding

As much as 80 per cent of critically short copper can be saved by the cladding process, says Joseph Kinney Jr., president, American Cladmetals Co., Carnegie, Pa. The firm rolls Electroshield, a copper cladmetal used to replace solid copper sheets in communications systems.

The metal sandwich that results

Huge Turbine Shapes up for TVA



PIT LINER of the fifth Kaplan propeller hydraulic turbine for the TVA Pickwick Landing plant is assembled in Allis-Chalmers' erecting shop in Milwaukee. Both regulating cylinders, gate operating ring and wicket gate levers are shown above. This unit is rated at 55,000 hp under 43-foot head at 81.8 rpm. Its cast steel ring has 37-foot 4-inch OD, height of 14 feet 4 inches and weighs about 225,000 pounds

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HE LIKES TO RAZZ TH' YOUNG GENERATION ABOUT THEM HAVING TO PUT COVERS AN' SAFETY DEVICES ON EVERYTHING TO KEEP TH' BABES OUT OF DANGER!
BUT HE KNOWS TH' VALUE OF SAFETY! DIDN'T HE SEND FOR TH' SAMPLE OF SOL-SPEEDI-DRI?
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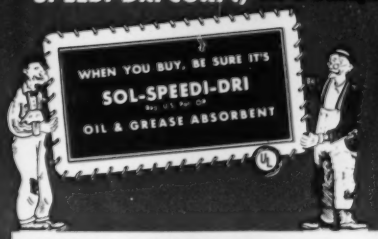

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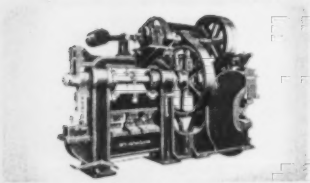
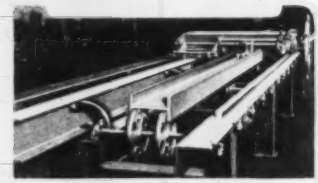
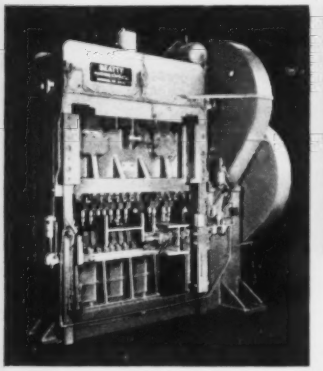


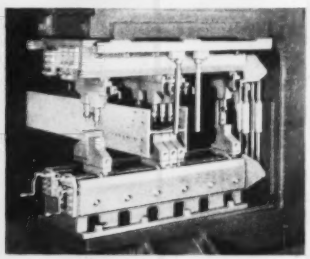
BEATTY Co-Pun-Shear—one compact unit that does coping, punching and shearing.



BEATTY Spacing Table handles flange and web punching of beams without roll adjustment.

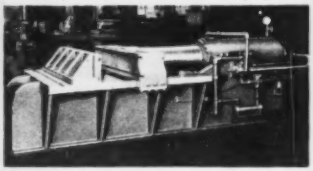


BEATTY No. 9 Guillotine Beam Punch for flange and web punching of beams up to 30".

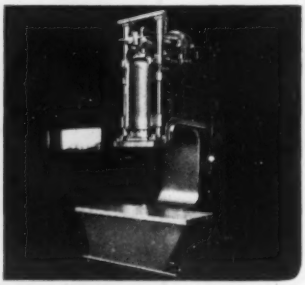


BEATTY Adjustable Tools punch webs of beams and channels, legs of angles and plates.

Below: BEATTY 250-Ton Gap Type Press for forming, bending, flanging, pressing.



BEATTY Horizontal Hydraulic Bulldozer for heavy forming, flanging, bending.



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Hammond, Indiana

One of these Beatty designs, modified to meet any specific requirements, may prove a winner for high-speed, low-cost production. Write for complete details on any machine. Or, if you have a tough production problem let us make a recommendation. Our broad experience in machine design may prove highly valuable to you.

when copper surfaces are bonded in sheets to carbon steel gives performance of solid copper, although composed mainly of the more plentiful and stronger metal. Growing from its original use in communications systems, cladmetal is being tested for radiators and may allow greater auto output in 1952. The company plans improvement of its facilities to work off an order backlog already several times total 1951 production.

Switch Exchange Plan Offered

An exchange plan for users, dealers and distributors of General Electric types T-47, T-470, and T-471 time switches has been announced by the company's meter and instrument department, Schenectady, N. Y. Under the plan, users of the time switches can return an inoperative or damaged switch or mechanism to their dealer, distributor, the nearest GE warehouse, or to one of three exchange points and immediately receive a new time switch in exchange.

According to a company spokesman, no charge for the new unit is made if the inoperative switch is returned within 18 months from the time of manufacture. If returned after the warranty period, a flat charge of $7.00 is required for exchange of the complete time switch, or $6.25 for the mechanism alone.

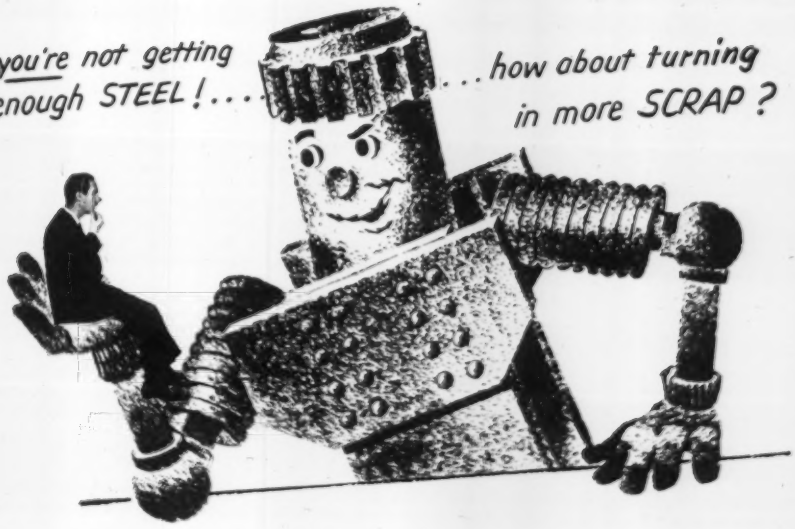
Metal Cutting Progress Shown

"Getting Down to Cases on Metal Cutting" is a 32-page booklet compiled by E. F. Houghton Co., Philadelphia, and offered to interested cutting tool users. Containing documented performance records, the illustrated report shows advances made possible with modern cutting fluids such as the company's Antisep base.

Examples of greater production, sizable savings in time and costs, plus finer finish and longer tool life, are presented in the collection of case histories. Details on machine feeds and speeds, types of machines, grades of steel and cutting fluid dilutions are included.

Standardization Savings Cited

Specific savings and production benefits directly attributed to standardization in American industry are cited in "Dollar Savings Through Standards," a presentation of 140 documented case history studies now made available by the American Standards Association. The book is a printing of a report prepared for the Economic Cooperation Administration, by the association, to encourage European manufacturers to adopt



There's only one quick way to get more steel!

...get more SCRAP to the mills, at once

LET'S be realistic about the scrap shortage. The need for scrap is desperate. It threatens to hamper our whole National Defense effort—and it vitally concerns *you* because it boils down to this:

Unless 100,000 tons of industrial scrap roll into the steel mills every day, steel production will drop, and there'll be *less* steel for everyone—you included.

On the other hand, if more scrap is turned in, more steel will be turned out—and the more steel that's made the more steel *you'll* get.

So—if you want more steel—do your full share in getting your scrap back to the mills. Comb through your plant, again and again. Tap every source of dormant scrap. Dig out every retired machine that you can possibly spare and rush it to your scrap dealer. Rip out any old rails and switches that are rusting away on unused sidings—and scrap them. Scrap your antiquated dies, jigs and fixtures, your worn-out tanks and boilers that are gathering dust in some forgotten corner. Make sure that not a single pound of scrap is by-passed. Sell it—ship it. It means good money for you, more scrap for the Nation's scrap pile, and more steel for *everyone*.

• • •

Remember—the Nation's productive effort depends primarily on steel—and steel depends on SCRAP . . . *your* scrap. Turn it in—NOW.

You'll find your local scrap dealers listed in the yellow pages of the phone directory.

This page would ordinarily be used to tell you about

U·S·S HIGH STRENGTH STEELS

but, because without SCRAP we cannot produce steel, we are asking instead for your all-out help in getting more SCRAP to the mills.

AMERICAN STEEL & WIRE COMPANY, CLEVELAND
COLUMBIA STEEL COMPANY, SAN FRANCISCO · NATIONAL TUBE COMPANY, PITTSBURGH
TENNESSEE COAL, IRON & RAILROAD COMPANY, FAIRFIELD, ALA. · UNITED STATES STEEL COMPANY, PITTSBURGH
UNITED STATES STEEL SUPPLY COMPANY, WAREHOUSE DISTRIBUTORS, COAST-TO-COAST
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS

1-1902

UNITED STATES STEEL

U.S. production methods in order to speed military preparedness and to strengthen economic independence.

The report is being released in this country by the ASA as a service to American industry. It may be obtained for $1.00 from the association, 70 E. 45th St., New York 17.

Abrasive Wheel Guide Published

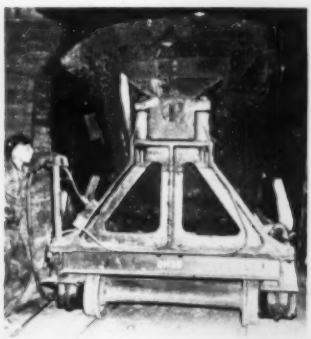
Allison Co., specialists for over 30 years in the manufacture of abrasive cutting wheels, announces the publication of a comprehensive catalog. Sixteen pages, including data on wet and dry cutting of various materials, information on abrasive cutting machines and their maintenance. Unique color-coded chart gives recommendations for the selection of both Allison rubber bonded and resinoid bonded wheels. Copies may be secured from the company at 257 Island Brook Ave., Bridgeport 8, Conn.

Testing Time Compressed

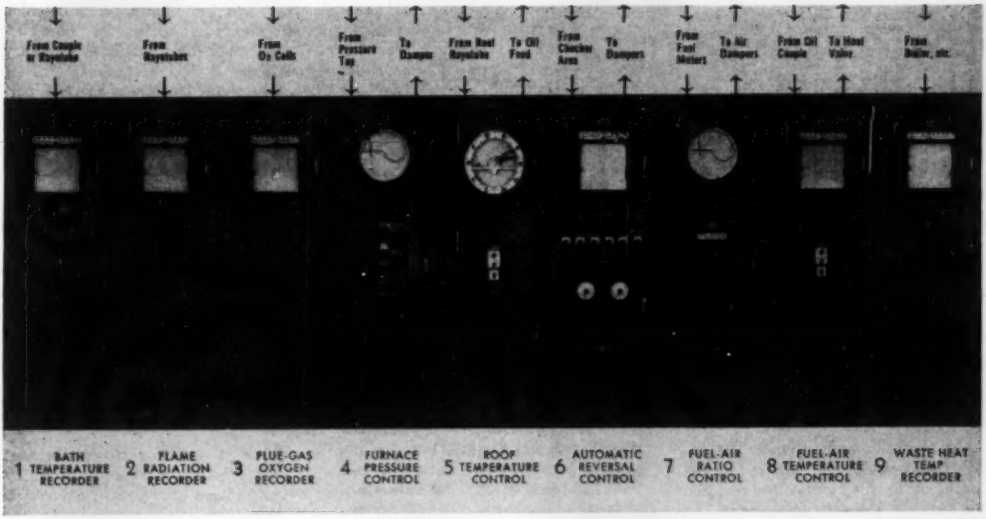
Steel alloys, other metals and plastics can be treated rapidly and accurately to find out how long they will stand up under normal loads when they are used for making moving parts of machines in the Dilastrain method developed by two scientists of Rensselaer Polytechnic Institute, Troy, N. Y.

The apparatus which Dr. Joseph L.

Ladle Weighing Improved



GREATER EFFICIENCY and economy in producing small accurate quantities of high alloy steels is achieved with a novel electronic weighing ladle car used at Standard Steel Works Division, Baldwin-Lima-Hamilton Corp., Burnham, Pa. Four SR-4 load cells of 20,000-pound capacity each are built into car as supports for the ladle. Connected through an armored cable to an indicator in the control pulpit, they sum up total load in the ladle automatically on a dial indicator



HOW MANY OF THESE 9 OPEN-HEARTH HELPERS CAN YOU USE?

THE open-hearth instruments shown above are used for four principal reasons . . . either to increase production, improve quality, save money, or give information which helps in planning future improvements.

1. Bath Temperature Recorder gives information which helps increase production and raise quality. Either thermocouple or Rayotube types available. Bath measurements are rapidly becoming standard practice in progressive mills and foundries.

2. Flame Radiation Recorder is a fuel engineer's research tool. Gives facts not otherwise available.

3. Oxygen Recorder saves fuel by showing combustion efficiency . . . regardless of stage of process or type of fuel. An "advanced" instrument well worth investigation by qualified engineers.

4. Furnace Pressure Control saves fuel by holding products of combustion in furnace for proper time and by helping smooth out the heating of checkers; lengthens refractory life by regulating air infiltration.

5. Roof Temperature Control speeds production by making it safe and easy to hold furnace continuously at maximum temperature; saves fuel and refractory, too.

6. Automatic Reversal Control often leads the parade for its combination of labor saving, checker saving, fuel saving, and general process improvement.

7. Fuel-air Ratio Control and related equipment is exactly what's needed for high-production heating speed and fuel efficiency when an open-hearth furnace burns a mixture of fuels, or switches fuels frequently.

8. Fuel Oil Temperature Control maintains correct viscosity of oil and therefore helps maintain even burner action and correct combustion.

9. Waste-heat Boiler-temp Recorder gives information for efficient combustion and proper boiler operation.

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- ☐ Bath Temp. Rec.
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- ☐ Furnace Press. Con.
- ☐ Roof Temp. Con.
- ☐ Auto. Reversal
- ☐ Fuel-Air Con.
- ☐ Fuel Temp. Con.
- ☐ Waste-heat Temp. Rec.

Rosenholtz and Prof. Dudley T. Smith have assembled in their laboratory makes possible the completion in 10 hours or less of a testing job which has been requiring three months or longer on costly machines under expert supervision. The importance of the Rensselaer discovery to industry of almost every kind, but especially to defense production, rests in the fact that government and industrial laboratories, the world over, are searching constantly for materials and alloys to meet new and demanding standards.

Industrial researchers want to know the endurance limit of each new material used for dynamic moving parts. They want to know the load it will bear without giving way as it goes through an infinite number of its movements.

Endurance limit, under testing methods which are employed presently, is found by subjecting test bars to varying loads or stresses and vibrating them until they either give way or prove sufficiently enduring. This ordinarily takes three months or longer since a half-billion cycles, of complete vibrations, may be set as a practical limit for testing materials which have been designed for moving parts of machines.

The method evolved by the Rensselaer scientists requires the selection of identical specimens of the material and putting them under stress in a definite range. They are then put through an equal number of cycles of vibration so that all will be on an even level of fatigue. This takes a few hours. The specimens are then placed in the apparatus and subjected to controlled temperatures ranging from 20° C to 100° C. The specimens all have the same length, about 2 inches, to start with but the inventors have found that as temperatures are stepped up each specimen changes in length in proportion to the amount of stress to which it has been previously subjected.

Apparatus automatically magnifies the amount of each expansion 3500 times and records it. In approximately 2 hours the total linear expansion of all test specimens has been recorded. When these values are plotted against the stresses previously applied to the specimens, it is found that a sharp dip in the resulting curve appears at the point where the test material reaches its endurance limit.

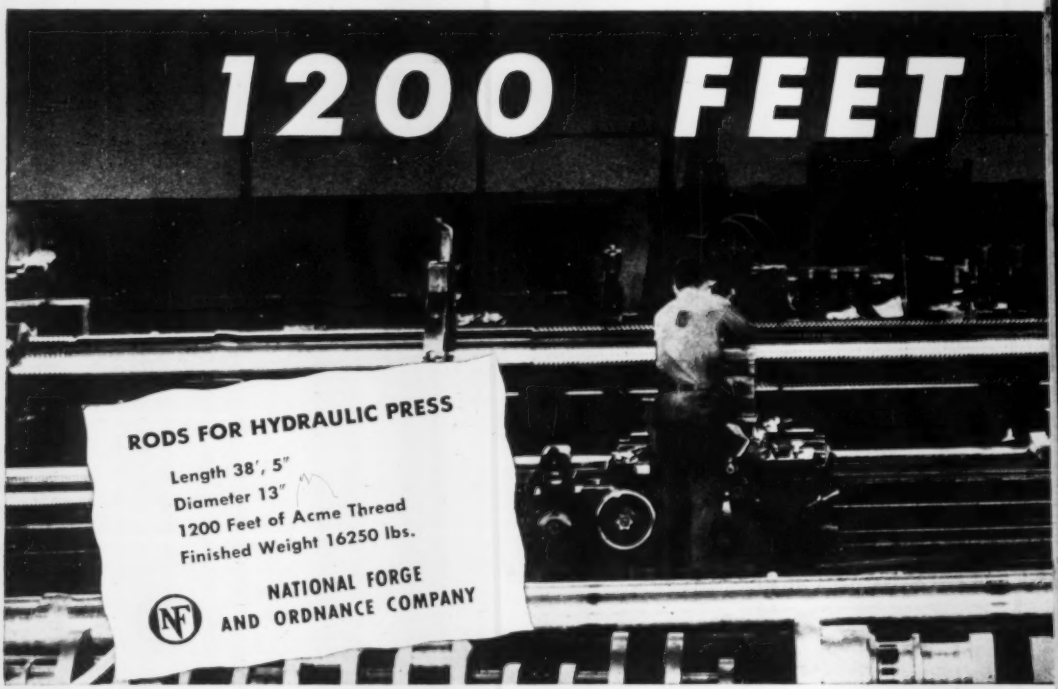
Tests have already been run on a chemically complex steel alloy supplied by the Allegheny Ludlum Steel Corp. and the endurance limit which was found is admittedly more accurate than that found by ordinary methods.

"Since the Dilastrain method permits the determination of such important engineering data as endurance limit with the greatest speed and accuracy, it is impossible to exaggerate its importance," says Dr. Gunther Mohling, assistant director of research for Allegheny Ludlum.

Test specimens are now being submitted by other basic industries. The inventors expect to make effective applications of the Dilastrain method to testing special alloys which are subjected to high temperatures in jet motors and gas turbines.

Scope of Tube Size Broadened

Scope of electric resistance welded carbon steel tube sizes produced by Welded Tube Division, Babcock & Wilcox Tube Co., Alliance, O., has been broadened. To aid both mechanical and pressure users, the company has published a chart covering the new range. This list is broken down to reflect average and minimum wall requirements in 0.08-0.18 and 0.20-0.30 per cent carbon grades. It covers sizes from $\frac{1}{2}$ to 4 inches OD and 0.032



to 0.213-inch average or 0.020 to 0.203-inch minimum wall thickness. Copies of the chart are available on request from the company's Alliance sales office.

U. S. Steel Expands Coal Study

A new laboratory for expanding the company's research in coal chemicals and coking processes has been opened by United States Steel Co. in Pittsburgh's East End district. Dr. E. C. Bain, vice president in charge of research and technology, said the laboratory will permit extended study in new uses for coal chemicals and in coking of coal for the steel industry. In coking research emphasis will be placed on the use of available coals in making metallurgical coke best suited to blast furnace requirements. Until now, only limited pilot plant scale experimentation on the subject has been possible in either the company's research and development center or the laboratory in Oakland.

Also in the new laboratory, one department is being set up for tests to aid in developing improved vitreous enameling steels, which are widely used in the manufacture of home appliances, and another for research on refractories used in iron and steel making furnaces. The new laboratory will make available about 20,000 feet of additional floor space for the research work of U. S. Steel's Pittsburgh district scientists and engineers. Included will be chemical engineering laboratories, where pilot plants can be set up to make test runs and observation of many new chemical engineering developments to aid the men in the mills.

Longer Carbon Mold Plug Life

A revised catalog section covering carbon mold plugs is announced by National Carbon Co. Plugs help to improve the quality of the cast ingot, prolong life of equipment and improve operating practice.

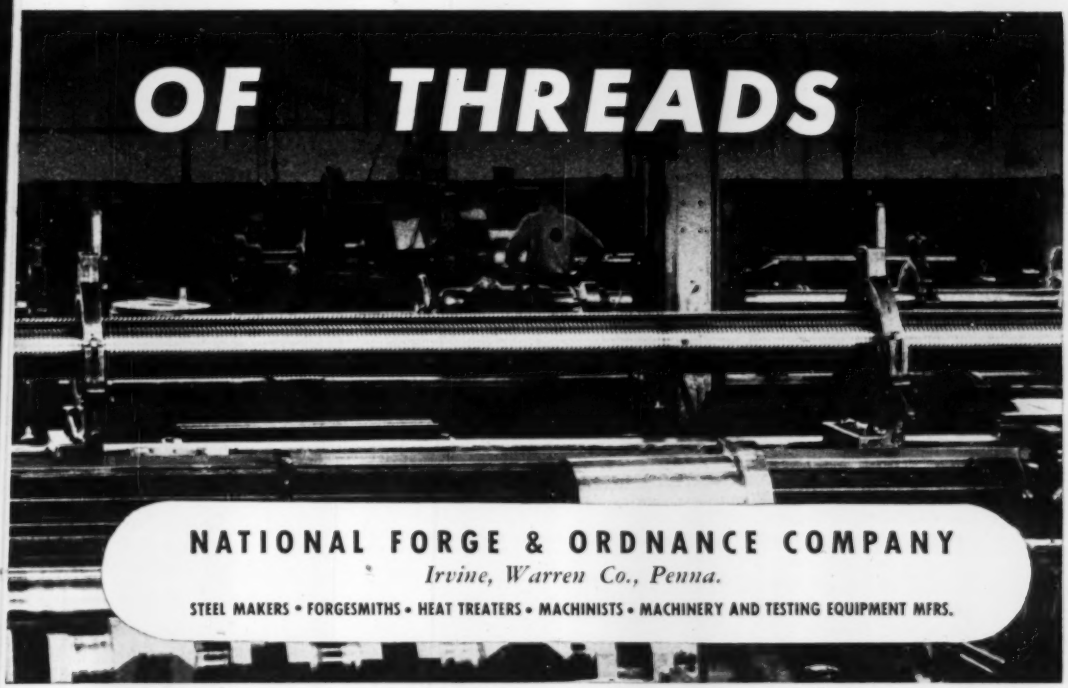
Listed are these advantages of carbon mold plugs: Elimination of inclusions in the ingot from the mold plug; little or no carbon pickup; plugs will not stick to the ingot and may be used more than once; they are light in weight yet mechanically strong; they can be handled without damage and may be securely placed in the mold opening without crushing, cracking or chipping of corners; they are consistently accurate in dimensions; leakers are reduced to a negligible percentage and steel loss and burning of mold buggies are reduced accordingly; mold life is increased.

Stock sizes available for immediate shipment and the standard sizes not carried in stock but supplied on order in quantities of 1000 or over are listed. Mold plugs are either packed in substantial corrugated cartons or palletized for shipment. For a copy of catalog section S-5600 or the reprint of a published report of one mill's 45,000 plug production run, write National Carbon Co., a division of Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17.

Tool Use Aids Offered

Utica Drop Forge & Tool Corp. is offering two wall charts. One explains how to use pliers. The other shows how quality tools are forged and electronically hardened.

These charts convey the message clearly and easily by means of pictures and diagrams with quick reading captions. Both are suitable for posting on factory tool cribs where tool users can see them, and for use in factory or school training courses. Copies may be secured by writing to H. J. Zellweger, advertising manager, Utica Drop Forge & Tool Corp., Utica 4, N. Y.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NATIONAL FORGE & ORDNANCE COMPANY
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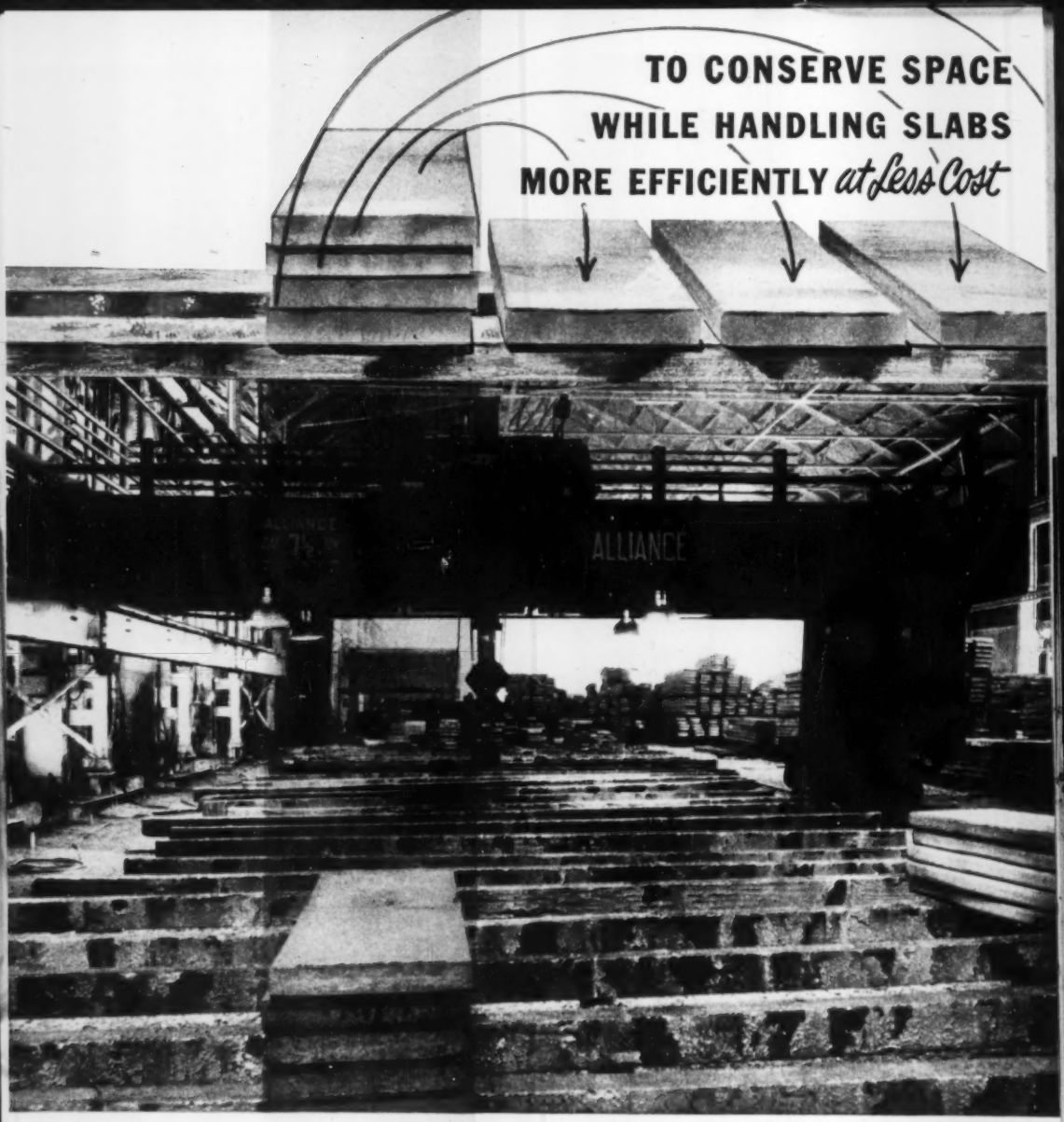

Alan Wood Steel Company uses *Alliance* telescopic crane

● Operating underneath the main overhead crane, this newly developed, stiff-leg, semi-gantry, 7½ ton Alliance Slab Handling Crane services the slab storage area of the building as it turns and positions heavy slabs on the scarfing bed.

A minimum of headroom is required as this Alliance crane utilizes a special telescopic ram rather than a rack type ram to conserve overhead space. And, because of the compact design, this type crane can be installed where the rack type could not because it requires more headroom. The operator is located on the gantry leg level with his work for perfect visibility.

Alliance, with more than a half-century of crane building experience behind them, is continually developing new ways to give industry added lifting power at reduced costs. Call in your Alliance engineer today for a frank discussion of your heavy material handling problems. Be prepared now and tomorrow.

Alliance

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SOAKING PIT CRANES • STRIPPER CRANES • SLAB AND BILLET
CHARGING MACHINES • OPEN HEARTH CHARGING MACHINES
SPECIAL MILL MACHINERY • STRUCTURAL FABRICATION

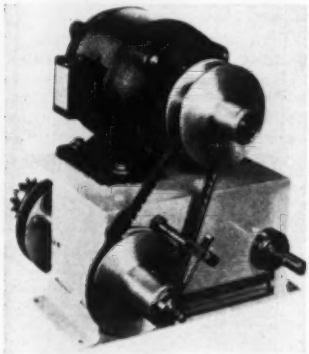
THE ALLIANCE MACHINE COMPANY
Main Office, Alliance, Ohio ★ Pittsburgh Office, 1622 Oliver Building

New Products and Equipment

Compound V-Belt Drive

USE REPLY CARD—CIRCLE No. 1

Accuracy requirements for calibration of jet controllers and tachometers are met by a compound v-belt drive developed by Speed Selector Inc., Cleveland, O. Capacities from light tachometer drives, ½ hp or less, to 10 hp are available. Larger drives for loads of 20 hp and higher are being developed. Ratios to 50:1 with



. . . meets aircraft accuracy requirements

speed ranges of 150-7500 rpm are produced by compounding successive pairs of wide range combination sheaves.

Prelubricated sealed ball bearings and precision-built variable pitch sheaves with sintered bronze bushings are used. Balanced stretchless steel cable v-belts are furnished either in regular or static-proof construction for hazardous locations. Single, free-operating balanced control with zero back lash for direct or remote locations changes pitch diameter of all sheaves simultaneously. Speed variations are held to less than ¼ of 1 per cent for any speed throughout the entire range.

Tool Works Flywheel Housings

USE REPLY CARD—CIRCLE No. 2

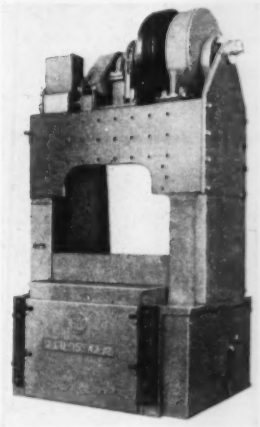
Flywheel housings are machined completely, except for disk grinding three faces, on a machine tool developed by Cross Co., Detroit 7, Mich. Operated at top efficiency, the machine is designed to permit two unskilled operators to produce 138 housings per hour. It includes 13 stations and has palletized workholding fixtures that hold parts securely during all operations and during movement between stations. An integral conveyor returns these fixtures to the loading station automatically. Chips are removed automatically from the fixtures and carried away by a vibrating type conveyor.

Machine is equipped with a Toolameter, device developed by the company to control tool life and stop the machine when tools need resharpening. This feature is combined with preset tools to speed changing and cut down machine adjustment. Other features include hardened and ground ways, hydraulic feed, automatic lubrication and construction to J.I.C. standards with stranded wire installation.

Gap-Type Welding Press

USE REPLY CARD—CIRCLE No. 3

Development of a gap-frame welding press, for use with welding fixtures in mass production of spot weld-



. . . for mass production spot welding

ing assemblies, is announced by E. W. Bliss Co., Canton, O. The gap style frame permits conveyorized feeding from side to side, facilitating access to the work by operators. Work is accessible from either front or back of press. Slide is located in lower portion of press and work stroke is upward. Parts to be welded are laid on a lower die containing welding tips and moved up into contact with fixed welding tips attached to upper part of press.

Pneumatic friction clutch, flywheel and motor are located at top of press for cleanliness and accessibility. Long enclosed eccentric rod to slide actuating mechanism in lower section connects driveshaft. Work stroke is adjustable and shut height the same for all adjustments. Slide widths on present models range from 42 to 84 inches with 12-inch depth on all widths.

REPLY CARDS

on page 161 will bring you more information on any new products and equipment in this section.

Electronic Damage Protection

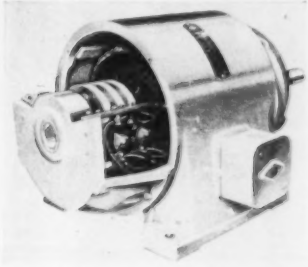
USE REPLY CARD—CIRCLE No. 4

Dual channel Protectron, developed by Brinnell Co., Simsbury, Conn., offers an electronic damage prevention method. Protectron guards two machines simultaneously when one is feeding the other in joint first and secondary operation. Where mechanical overload might damage machines, the protector stops both units. It works with equal effect in event of pile-ups, misfeeds, tool dullness, overhard or oversized stock, instantly tripping both machines and conveyor to halt operation.

Slip Ring Motor Redesigned

USE REPLY CARD—CIRCLE No. 5

Redesigned slip ring motor that features collector rings and brush assembly arranged for complete housing in the motor's regular end bell



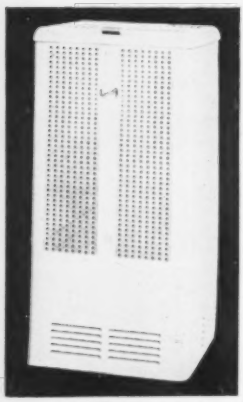
. . . adds to arcing and flashing protection

is offered by Reuland Electric Co., Alhambra, Calif. Design eliminates traditional assembly protrusion and reduces essential dimensions to those of standard squirrel cage motors. Dimension cuts range to 6 inches from conventional length.

Through use of flat end bells,

Hendrick Ornametal

TRADE MARK



Hendrick Ornametal is a decorative, lightweight metal grille suitable for a wide variety of applications, such as for stove panels as shown in the illustration.

Furnished in a wide variety of attractive designs, Ornametal is made of a special bright finish, cold rolled steel, suitable for painting or plating, and is available in a wide range of stock size sheets and gauges. Write for full information.

1876—Seventy-Fifth Anniversary—1951

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Perforated Metal Screens
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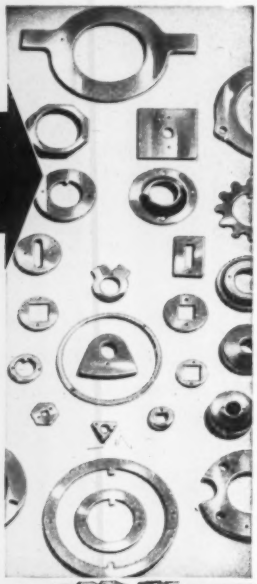

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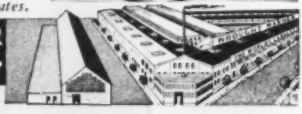


WROUGHT WASHER MANUFACTURING CO.

The World's Largest Producer of Washers

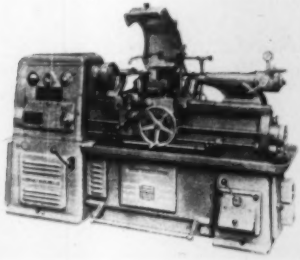
2103 S. BAY ST., MILWAUKEE 7, WIS.

motors have added mounting versatility. Brakes and other equipment can be attached on either end using face or flange type mountings. Other features include shorter bearing-to-bearing spacing; wound rotor construction immersed in varnish and baked to rigid mass for maximum vibration resistance; and larger inspection openings for easy access to collector rings and brushes. Motors are available separately in ratings from ¾ to 15 hp; in conjunction with the company's gear reducers, in ratings from ¾ to 5 hp.

High Speed Hydraulic Lathe

USE REPLY CARD—CIRCLE No. 6

High speed hydraulic copying or profiling lathe, made by Batignolles-Chatillon Locomotive Co., Paris, is introduced by H. E. B. Machine Tools Inc., 341 Madison Ave., New York, N. Y. Lathe, model OP, has top spindle speed of 3600 rpm. Bed



. . . copies axial lengths to 0.0015-inch

is heavily cross-braced, and with a one-piece base forms a sufficiently rigid foundation. Copying device is an integral part of the machine, working to within 0.0004-inch on diameter. Rear tool maintains 0.0002-inch on diameter and axial lengths are copied to within 0.0015-inch. Workpieces are copy-turned with a single tool in one continuous cut. Machine can be used also as an ordinary high speed center lathe without adjustments.

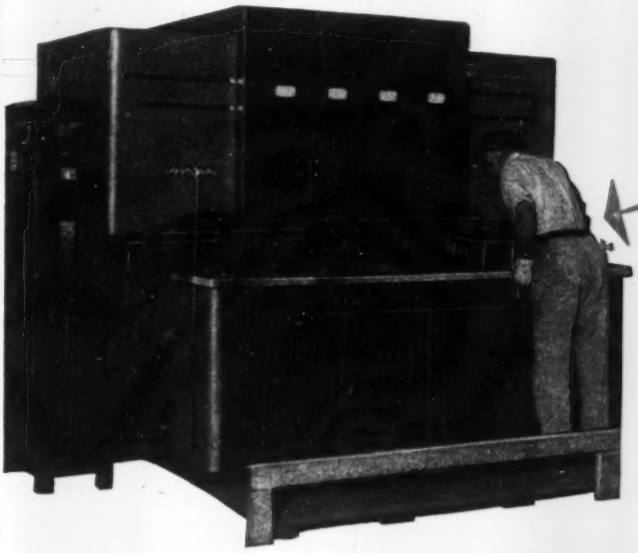
Heavy Duty Industrial Welder

USE REPLY CARD—CIRCLE No. 7

Heavy duty direct current welder, designed by A. O. Smith Corp., Milwaukee, Wis., is a general purpose machine intended for direct current industrial uses. Freedom from stack failure is accomplished by directing high velocity downdraft of cool air over rectifier stacks before passing this air through other parts of the machine. The blast is expelled at the welder's base, assuring proper cooling and promoting internal ma-

HOT FORMULA!

RF = LC + BP – R



Puts The Heat On Parts Production at Oliver

RF = LC + BP – R means: Radio Frequency heating equals Lower Costs plus Better Product minus Rejects . . . and here's how this formula paid off for the Oliver Corporation, Charles City, Iowa.

Oliver needed a heat treating process flexible enough to handle 15 different parts, ranging from ½ inch sleeves, lever arms and valve seats to long shafts. The hardening operation, requiring as many as 10 daily set-ups, had to supply varied parts of consistently high quality, or production would be delayed.

Oliver installed a 50 KW-450 KC RF Generator and work-handling equipment, all Westinghouse-built, which easily handled all parts, and required only about 10 minutes of an unskilled operator's time for changing set-ups. The RF induction heating process drastically cut costs 43%, and there were *no* rejects—with the net result that Oliver is able to produce a better tractor faster and cheaper.

See how this formula—or one of its many variations—has solved the heating problems of other manufacturers—problems that may parallel your own. Write for case history booklet, B-4782, Westinghouse Electric Corporation, Dept. S22, 2519 Wilkens Avenue, Baltimore 3, Md.

J-02233

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INDUCTION HEATING

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ADAPTABILITY *Could Be What You Need!!*

As your requirements become more exacting and your practices more individual, your need for grinding wheels *engineered to your requirements,* becomes imperative.

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PRECISION GRINDING

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Write for Them NOW!

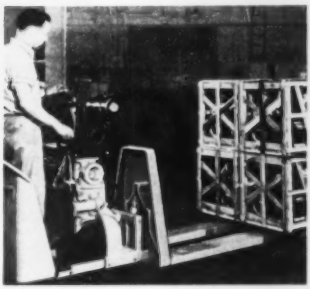
Electro HIGH-SPEED RESIN BONDED GRINDING WHEELS

chine cleanliness. Retained in this unit are principal construction features of the company's alternating current welder: Case-diameter fan and "wind tunnel" design to assure adequate, efficient air flow over all energized parts. Primary coils are raised and lowered easily on ball bearing jacks. Machine is made in 200, 300 and 400 amp ratings.

Trucks Have Increased Power

USE REPLY CARD—CIRCLE No. 8

Increased horsepower on all Truck-Man industrial trucks is announced by Truck-Man Division, Knickerbocker Co., 657 Liberty St., Jackson, Mich. In production with the Wisconsin AKN air-cooled engine, power change from 4.4 to 5.8 hp represents an increase of 32 per cent. To get this increase, displacement was raised from 13.5 to 17.8 cu in. Trucks are made in hydraulically operated skid lift and pallet lift models, utility platform and tractor types, all with 360 degree steering and pneumatic-tired drive wheels.



. . . displacement is raised 4.3 cu in.

Dual Circuit Air Conditioners

USE REPLY CARD—CIRCLE No. 9

Series of dual-circuit air conditioning units that contain all elements of a central station plant, including evaporative condenser, are offered by United States Air Conditioning Corp., 3300 Como Ave., Minneapolis 14, Minn. Designated DRK, the models are designed for economic operation at full or half capacity. They provide self-contained equipment suitable for installations that involve load variations and require true capacity control. Separate refrigeration circuits provide effective dehumidification when operating at reduced capacity.

Internal wiring alternates the lead compressor, insuring even wear. A time delay relay prevents both compressors from starting simultaneously. For normal operation, units are wired

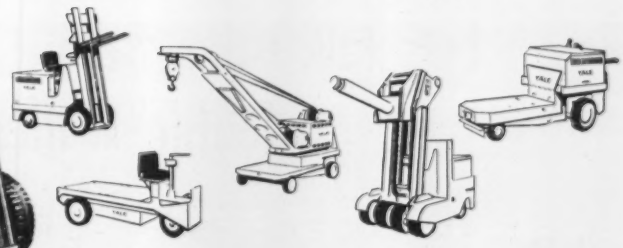
THE BIG 89% PROVES SUPERIORITY OF YALE ELECTRIC TRUCKS

89% of the Yale Electric Trucks sold today are bought by previous users... so satisfied with Yale performance and Yale economy that Yale is their choice again.

THESE USERS had ample opportunity to make every on-the-job test—to compare Yale Electric Trucks with any others—to get dollars-and-cents proof of how Yale saves man-hours, steps up production, speeds all materials handling jobs.

These users found Yale Electric Trucks pay for themselves faster...then go on giving many years of service... taking the toughest jobs right in stride.

If you're not already among the users of Yale Electric Trucks, be guided by the Big 89% and this proven record of satisfaction. Ask your Yale Representative to show you the actual performance records which persuade Yale users to buy Yale Electric Trucks again and again.



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YALE GAS AND ELECTRIC INDUSTRIAL TRUCKS • YALE *WORKSAVERS* • YALE HAND TRUCKS • YALE HAND AND ELECTRIC HOISTS

Let's talk turkey about tubing ...double-walled Bundyweld!

Bundyweld Tubing is double-walled from a single strip. Exclusive, patented beveled edge affords smoother joint, absence of bead, less chance for any leakage.

No other small-diameter tubing offers all the features of famous Bundyweld. For no other tubing is like it.

This multiple-walled type of Bundy® tubing is double-rolled from a single strip of steel, and copper-bonded throughout 360° of wall contact. Bundyweld is extra-sturdy, easy to fabricate, highly resistant to vibration fatigue or stress in rugged, gruelling spots.

Behind the Bundyweld features are superlative skills and services that only the world's largest producer of small-diameter tubing can provide in the design and fabrication of tubing parts. Why not call Bundy Tubing Company today?

Bundy Tubing Company

DETROIT 14, MICHIGAN

WORLD'S LARGEST PRODUCER OF SMALL-DIAMETER TUBING • AFFILIATED PLANTS IN ENGLAND, FRANCE AND GERMANY

for use with a two-stage thermostat. Conditioner can be converted easily to a heating plant through addition of steam or hot water heating coil. Units are offered in 15, 20, 25, 30, 40 and 50-ton capacities.

Fork Device Handles Drums

USE REPLY CARD—CIRCLE No. 10

Horizontal drum handling device made by Philadelphia Division, Yale & Towne Mfg. Co., 11000 Roosevelt Blvd., Philadelphia 15, Pa., can be attached to any industrial fork truck without removing forks or making any hydraulic or mechanical connections. The unit is self-contained, fits over forks and is fixed to them with two screw clamps. The drum handler picks up one or two standard drums as it is lowered over them while truck backs slowly away. Rear clamps are spring loaded and snap

. . . fixed to forks by two screw clamps

under drum's lip. Gravity action locks clamping hooks in place as drums are lifted. At no time are the springs under any load.

To deposit drums, device is lowered, truck is moved forward stretching springs on rear clamps and, as soon as forward clamps are freed, channels on the truck are tilted back. Truck is then backed away to free rear clamps. Unit cannot drop load with sudden stops, when traveling over a rough surface or when truck channels are tilted. Drums can be stacked to any height within lifting range of the truck.

Tool Hones Main Bearings

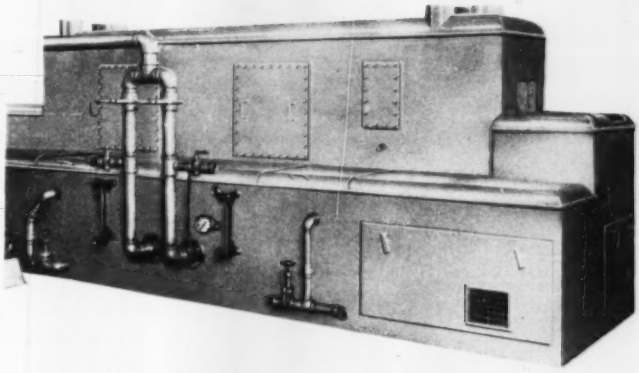
USE REPLY CARD—CIRCLE No. 11

Guided tool and automatic machine, developed by Micromatic Hone Corp., Detroit 4, Mich., hones main bearings to 0.0005-inch total tolerance. The machine's two columns are set facing each other in conveyor lines and blocks taken from the line are

in your spray washer

DETREX 53

makes short work of dirt



You save time . . . make short work of cleaning . . . when you use a spray-washer compound that's right for your job.

On steel, cast iron, magnesium and die castings, Detrex 53 is right! You get the best removal of oils, grease, shop dirt, chips, and other soils . . .

And these plus advantages:

★ NO FOAMING ★ NO DUSTING ★ NO ODOR

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widest range of designs and sizes from 1/100 to 85 hp
If your speed reducer needs are within the fractional through 85 hp range . . . if your required ratios are from 1.1:1 through 50,000:1 . . . if your maximum output torque must be between 32 and 113,000 in. lbs., Winsmith is the only name you need remember.
Only Winsmith covers this range so completely. Only Winsmith has so thoroughly standardized this range in a carefully graduated series of sizes.
And within this range . . . from this one source . . . you have the widest diversity of sizes and shaft locations in the worm, helical and worm-helical types, plus the unrivaled scope of the Winsmith patented differential gear design.
Yes, Winsmith is an important name to remember in speed reducers. It means so much to the design engineer in fulfilling his exacting needs. It means so much to the user in its exacting performance.
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SPEED REDUCERS

automatically tipped up on end and transferred to the fixture of either column. Automatic controls regulate honing cycle for each block and indicate which column receives the block from the line. As the block is finished it is indexed onto a tilting table and back to the conveyor line. Alignment is generated by a guided tool having one bank of abrasives and seven of plastic guides. Guides are spaced to stablize the tool as abrasives pass from bearing to bearing. Stone wear indicator tells when abrasives should be changed.

Deflector Cuts Loading Labor

USE REPLY CARD—CIRCLE No. 12

Truck and car loading are completely automatic to the stacking point with application of a deflector developed by Wilkie Co., 5520 Arch St., Philadelphia 39, Pa. Attached to the platform end of a telescoping portable conveyor, deflector guides cartons off permanent belt conveyor and shunts them, at 90 degrees, onto a portable telescopic conveyor that extends into the load. Units are available for deflection to either side. No height adjustments are needed when conveyors are shortened or extended and one man can set the system up in a few minutes. The equipment is mobile and can be used on the loading platform.

Portable Insulation Tester

USE REPLY CARD—CIRCLE No. 13

High voltage portable direct current insulation test unit is offered by John Hewson Co., 106 Water St., New York 5, N. Y. The instrument is applied to prevent insulation breakdowns on all types of high voltage equipment by detecting weaknesses before damage occurs. Tests are possible at more or less than the full operating voltage of the equipment to which it is applied. Designated TAKK by the company, it is made for ranges of 0-15, 30, 45, and 75 kv. Testing procedure will not damage or impair effectiveness of the insulation.

Measuring Straight Line Motion

USE REPLY CARD—CIRCLE No. 14

Measuring system that facilitates laboratory and machine design investigation is offered by Automatic Temperature Control Co. Inc., 5200 Pulaski Ave., Philadelphia 44, Pa. Called the Atcotran Servo Kit, the system is basically a servo-mechanism that operates on linear transformer principle. It allows for measurement of straight line motions such as displacement of a bellows or

Rolling an Ingot — *Scratchboard Drawing for Pittsburgh Steel Company by William Pendred*

Progress in Steel

New Blooming-Slabbing Mill Shapes More Steel

The rolling of steel will soon take on a deeper and more powerful significance when Pittsburgh Steel's new seven million dollar high lift blooming-slabbing mill goes into operation before the first of next year. Another important step in the company's Program of Progress will have been completed.

Pittsburgh Steel Company's expansion program is on the move—more raw material will be provided—blast furnace capacity will be increased—open hearth furnaces enlarged—a fifty percent increase at the ingot level—an extra half million tons of steel per year.

In this giant new blooming-slabbing mill glowing steel ingots will thunder back and forth, spitting sparks and rumbling as they are reduced in cross section and lengthened into blooms and slabs. Heavier ingots will be handled than in the past and at a greater speed. Quality will be maintained—production increased.

From the new mill will come more high quality steel—steel that will be channeled into the Pittsburgh seamless tube, rod and wire mills. Later, slabs for the new 66-inch hot strip-sheet mill, now under construction, will also be rolled on the blooming-slabbing mill.

The increased volume of steel rushing from this massive new mill will help answer the universal cry for more steel products to maintain a free world through adequate supplies of both military and civilian goods.

Pittsburgh Steel Company

Pittsburgh, Pennsylvania

diaphram, motion of a float or tilt of a weigh beam. Kit contains a differential transformer, amplifier, terminal block, mounting block, a 4-wire connection cable and the company's standard servo mechanism. It can measure force, motion, torque, tension, thickness, and edge position.

Gages Determine Sheet Weight

USE REPLY CARD—CIRCLE No. 15

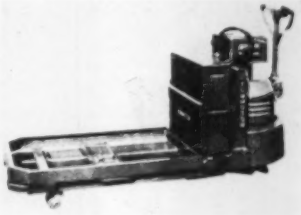
Two absorption and backscatter beta gages developed to determine weight per unit area of sheet material, are announced by Tracerlab Inc., 130 High St., Boston 10, Mass. To determine weight changes in sheet material, high energy electrons are emitted from a sealed radioactive source and passed through the sheet to be measured. The gage, in effect, weighs a small area of the moving sheet by this beam of radiation. If material's density is maintained constant, meter can be calibrated in units of thickness. Beta gages are unaffected by speed of the moving web, do not contact material being gaged and may be installed in any location on the machine. Meters or recorders can be placed at a distance. Backscatter gages offer advantages for many installations because they are mounted on one side of the sheet only. The latter type use the same console and recording apparatus as do absorption types.

Pallet Truck Has Platform

USE REPLY CARD—CIRCLE No. 16

Platform adapter for its electric pallet trucks is available from Towmotor Corp., 1226 E. 152nd St., Cleveland 10, O. Device converts the company's model W pallet truck to efficient handling of platforms, skids and tote boxes. Constructed of steel framework, the platform does not obscure operator's vision as it folds over the battery when not in use.

Height of the forks with adapter is 7 inches in lowered position, 11 inches raised. Adapter is available in lengths to match standard pallet truck forks to 72 inches long. Attachment is designed for use on the company's trucks powered by lead acid batteries under 27 inches long, but special units for use with longer batteries can be designed.



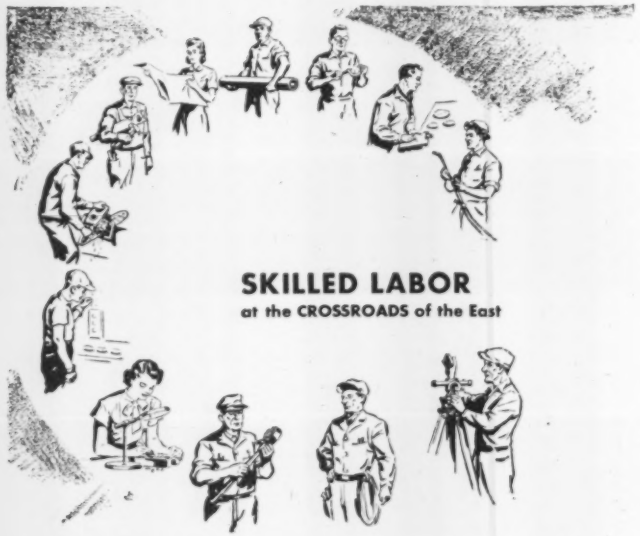
. . . converts truck to tote, skid handler

Pump Is Utility Unit

USE REPLY CARD—CIRCLE No. 17

Completely submersible utility pump having applications in maintenance, operating and engineering fields is available from Kenco Inc., 1125 N. Ridge Rd., Lorain, O. Its principal uses are in the many types of sumps found in factory layouts, such as boiler room pits, underground utility installations and elevator pits. The unit's submersible feature is made possible by the company's liquid level control switch, eliminating the need for a float.

Switch has no moving parts exposed to water; turns the pump on automatically when air pressure created by water rising in the switch skirt moves a diaphragm. Water, silt or other debris cannot foul the switch. Motor is hermetically sealed in oil, requiring no oiling or greasing. Pump



SKILLED LABOR
at the CROSSROADS of the East

As one of the leading industrial states in the country New Jersey offers a labor force commanding a wide range of skills. This is reflected in the unusually high value of manufactured products per wage earner which is evident in all surveys concerning the labor force of the Crossroads of the East.

Latest available statistics show that 59 per cent of the State's non-agricultural workers are employed in manufacturing industries. Out of every 1,000 inhabitants, 164 work in factories. Few states, if any, can match these figures.

New Jersey's many advantages and high degree of economic stability have proved attractive to almost every type of industry, both large and small. Contributing factors to the favorable environment are the existence of numerous plants that turn out a variety of semi-finished parts and sub-assemblies to augment the operations of other plants, as well as an abundant availability of basic supplies and specialties within overnight delivery distance from nearby states.

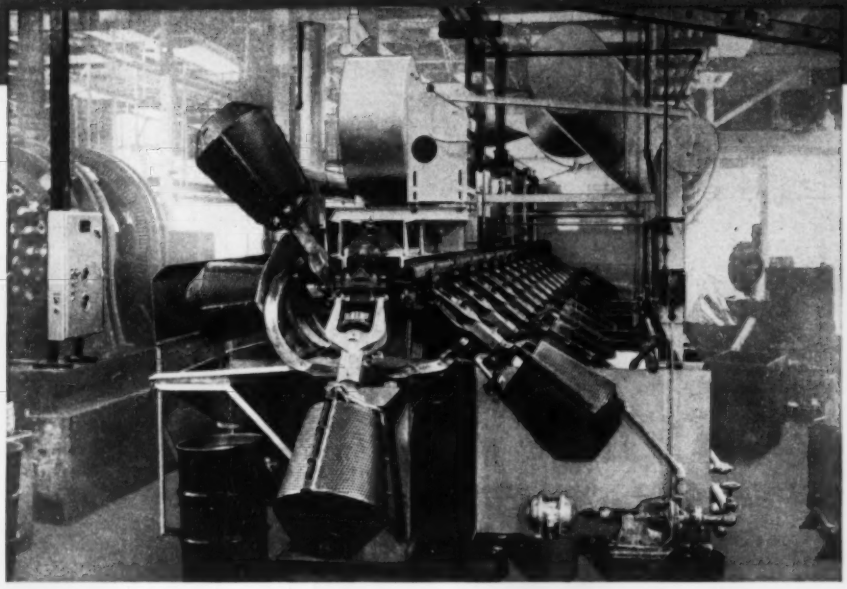
Write for your copy of the new digest about New Jersey, "An Industrialist's View of the Crossroads of the East." Box G, Public Service, 76 Park Place, Newark, N. J.

PUBLIC SERVICE
ELECTRIC AND GAS COMPANY
NEWARK, N. J.

NEW JERSEY CROSSROADS of the EAST

Presenting

THE NEW STEVENS SUPER "E" FULL AUTOMATIC BARREL PLATING MACHINE



Imagine one man processing 16,000 pounds in eight hours! That is what this new Stevens plating machine can do for you. Like the famous Stevens Model "C," the new Super "E" Model can be used for Cleaning, Pickling, Plating and Drying—and it will automatically unload the processed parts. All you do is load it manually or automatically.

Designed primarily for the plating and finishing of bulky metal parts in large volume, the Stevens Super "E" will bring important savings to your operations. Low cost per piece or pound is immediately evidenced. Both the Stevens Super "E" and smaller Model "C" are the only full automatic barrel plating machines on the market today.

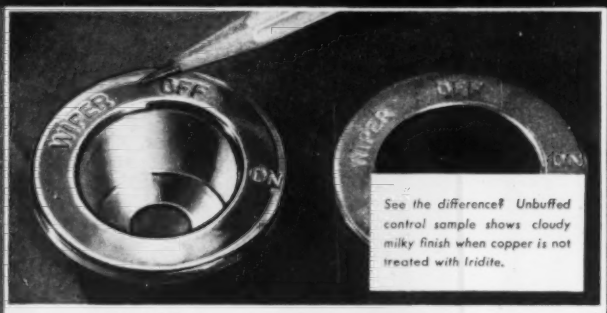
If your production involves plating or finishing of bulky metal parts in volume, it will pay you to investigate this new Stevens Super "E" Model. Ask your Stevens representative for details or write direct to *Frederic B. Stevens, Incorporated, Detroit 16, Michigan.*

METAL FINISHING EQUIPMENT AND SUPPLIES SINCE 1883

FREDERIC B. STEVENS INCORPORATED

DETROIT 16, MICHIGAN

LOOK— what you get WITHOUT BUFFING



See the difference! Unbuffed control sample shows cloudy milky finish when copper is not treated with Iridite.

with IRIDITE® Metcote in
COPPER-CHROME FINISHING

This sparkling bright finish is the result of just a simple dip in Iridite Metcote between the copper and chrome plating cycles! You actually get the clear, bright appearance of copper-nickel-chrome because the Iridite treatment gives maximum brilliance and clarity to the copper undercoating.

FORGET BUFFING COSTS, PR PLATING! Once you've properly prepared the base metal . . . steel sheet or zinc casting . . . you can completely forget buffing costs because no further buffing is required! And, there is no need to resort to PR plating or extra brightener in the copper plating solution because of the chemical polishing action of Iridite Metcote. The result? A pleasing clear, sparkling bright finish that is ideal for decorative products.

PROVE IT YOURSELF! Send us samples of your product for test-processing with copper, Iridite Metcote and chrome. Then make your own inspection and tests. Once you've seen your own product treated with this Iridite finishing system you'll never go back to slower, more costly buffing for your bright finishing. Start saving money *now*—write us direct or call in your nearest Iridite representative. Look under "Plating Supplies" in your classified telephone directory.

Iridite is approved under government specifications.

ALLIED RESEARCH PRODUCTS
INCORPORATED
4004-06 E. MONUMENT STREET • BALTIMORE 5, MD.

REPRESENTATIVES IN PRINCIPAL INDUSTRIAL CITIES; West Coast: L. H. BUTCHER COMPANY
Manufacturers of Iridite Finishes
For Corrosion Resistance and Paint Systems for Non-Ferrous Metals; ASP Plating Chemicals

has capacity of 3300 gallons per hour; is driven by a 1/3 hp motor.

Unit Holds Current Constant

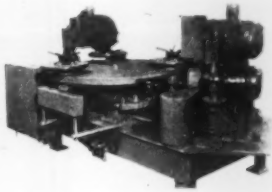
USE REPLY CARD—CIRCLE No. 18

Norelco MA stabilizer, made by North American Philips Co. Inc., 750 S. Fulton Ave., Mount Vernon, N. Y., is designed to hold tube currents constant. Effective at any given setting when used with the company's water-cooled x-ray diffraction equipment, the stabilizer has three ranges: 0.5 to 2, 7 to 25, and 25 to 50 milliamperes. Three-position lever switch mounted on stabilizer chassis end permits easy stage selection. Mechanical stop on the variable auto-transformer assures sufficient x-ray tube voltage—approximately 10 kv—and prevents excessive heating of the tube filament.

Ring Gear Deburring Machine

USE REPLY CARD—CIRCLE No. 19

Development of a ring gear deburring machine that works approximately 525 gears an hour is announced by General Riveters Inc., 785 Hertel Ave., Buffalo 7, N. Y. Machine is arranged for one unloading and loading position and two brushing



. . . works approximately 525 gears per hour

positions, each of the latter brushing top and bottom of the gear teeth. Quick-acting chucks permit the operator to unload and load six gears in a 7½-second cycle. Machine's movements are entirely automatic and fitted with a time relay to adjust the timing of the cycle. Chuck in the loading position is held stationary while loading, and starts revolving before it gets to the brushes.

Coolant Table Has Eight Nozzles

USE REPLY CARD—CIRCLE No. 20

Coolant table equipped with built-in pump, reservoir and eight semi-rigid, flexible metal nozzles is offered by Commander Manufacturing Co., 4221 W. Kinzie St., Chicago 24, Ill. The table takes advantage of a shorter coolant circulating stream to deliver full volume flow from one to eight nozzles. Multi-nozzle design assures adequate supply of coolant at precise point desired. Elimination

FLEXINEERING

PENFLEX'S ANSWER TO YOUR FLEXIBLE TUBING PROBLEMS

An extra man to help you plan new products requiring flexible tubing or to solve problems on old products. That's the service Penflex's "Flexineering" offers you. Flexineering is the scientific application of the right size, weight and type of flexible tubing on the right installation or product to assure the longest life with the greatest efficiency.

Coast to coast . . . border to border, Penflex installations prove the value of "Flexineering."

When you require tubing or hose that is as tight as a pipe but flexible, safe at high temperatures . . . free from metal fatigue . . . specify Penflex

Penflex manufactures a complete line of four wall interlocked and seamless welded corrugated flexible tubing in sizes from $1/8$" to 30" I.D. Write today for your copy of "Flexineering."

Pennsylvania Flexible Metallic Tubing Company, Inc., 7219 Powers Lane, Phila. 42, Pa.
Branch Sales Offices: **Boston • New York • Chicago • Houston • Cleveland • Los Angeles**

penflex

HEART OF INDUSTRY'S LIFE LINES

Heavy Industries Use
KRANE KAR
SWING-BOOM MOBILE CRANE
to Cut Costs by Handling Loads Easier, Faster, Safer

Stacking fittings at a Los Angeles Public Utility

Unloading boxcar at Southern Pacific's General Stores Dept.

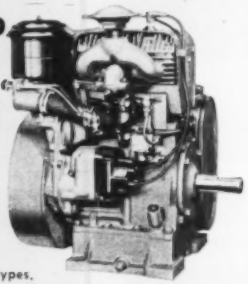
Handles tubes and heavy equipment at the Wilmington Refinery of the Union Oil Company

Gas or diesel, 12 to 37 ft. booms, or adjustable telescopic booms; solid or pneumatic rubber tires. 1½, 2½, 5, and 10 ton cap. Buckets, magnets, all-weather or foldable tops, and other accessories available.

WRITE FOR BULLETIN NO. 79

SILENT HOIST & CRANE CO. 849 63rd ST., BROOKLYN 20, N.Y.

POWER ADVANTAGE in the 7 to 13 hp. Range...The 2-Cylinder
WISCONSIN
Air-Cooled ENGINES



Here is the POWER ADVANTAGE story of the 2-cylinder Wisconsin Heavy-Duty Air-Cooled Engines, the development of which fills the need for a power linkage between the single-cylinder and four-cylinder types.

1. Dependable air-cooling under all climatic and weather conditions.
2. Self-cleaning tapered roller bearings at both ends of the crankshaft to withstand either side-pull or end-thrust without danger to bearings.
3. Rotary type high tension OUTSIDE Magneto with Impulse Coupling operates as an entirely independent unit that can be serviced or replaced in a few minutes.
4. Maximum torque at usable speeds for equipment that really has to go to work.

CONDENSED SPECIFICATIONS

MODELS		TE	TF
Bore	inches	3	3¼
Stroke	inches	3¼	3¼
Piston Disp. cubic inches		45.9	53.9
Horsepower			
1400 rpm		7.2	8.6
2000 rpm		10	12
2600 rpm		11.2	13.3
Net weight in lbs., Standard engine, side-mount tank		220	220

Our engineering department will gladly cooperate with you in adapting Wisconsin Engines to your requirements. Write for detailed data and name of the nearest Wisconsin distributor.

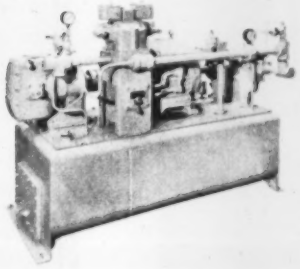
WISCONSIN MOTOR CORPORATION
World's Largest Builders of Heavy-Duty Air-Cooled Engines
MILWAUKEE 46, WISCONSIN

of long hose lines and floor units indicates simplicity and portability of operation. Flexible metal nozzle construction permits quick adjustment to any position. Table surface is precision ground to provide smooth working surface.

Unit Converts Slower Presses

USE REPLY CARD—CIRCLE No. 21

Packaged oil hydraulic power and control unit, designed to convert older, slow-speed hydraulic presses and extrusion machines to higher speeds, is offered by Rucker Co., 4228 Hollis St., Oakland 8, Calif. Conventional high-low pressure and volume construction is incorporated with high



. . . gets needed cylinder speed quickly

pressure circuit to hold cycle at exact speed desired.

This construction not only gets needed cylinder speed quickly, but permits altering pressing or extruding speed during operation by manual controls, as job indicates. Unit has electric control valving, decompression unit, micronic filters, and large oil reservoir tank that is sized to meet specific job needs. Sizes range to 125 hp at 5000 psi.

Control Cable Transmits Force

USE REPLY CARD—CIRCLE No. 22

Mechanical remote control system for transmitting motion or force in machine tool installations is a development of Teleflex Inc., Box 4408, Philadelphia 40, Pa. Control operates through movement of flexible cables within a conduit. System can be run around corners or obstructions, producing favorable results in tension and compression.

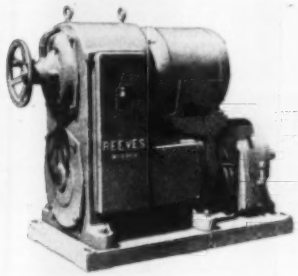
Screw-type design that reduces friction and permits push-pull motion through bends consists of an outer wire of comparatively large diameter wound around the cable's main body. Outer wire or helix engages a specially hobbed wheel in control boxes to permit unlimited ro-

tary movement. Cable design also provides a reservoir for lubricant that reduces maintenance and cuts down possibility of freezing.

Motordrive Has 25 hp Capacity

USE REPLY CARD—CIRCLE No. 23

Vari-Speed motordrive with capacity of 25 hp is offered by Reeves Pulley Co., Columbus, Ind. Designated model 8000 the unit is available in all speed ranges from 2:6 to 6:1. It is a complete self-contained variable speed power plant, combining the company's speed-varying mechanism



. . . available in speed ranges 2:6 to 6:1

with the user's choice of standard speed motor. Also available in the standard design is a built-in helical gear reducer for use when low output speeds are required. Handwheel control is standard, but electrical or completely automatic hydraulic controls also are available. A tachometer, calibrated to individual specifications, can also be attached. The unit is offered in horizontal and vertical designs.

Glass Fiber Reinforced Sheet

USE REPLY CARD—CIRCLE No. 24

Dynakon Corp., Cleveland 3, O., introduces G1A, a medium high strength glass fiber reinforced plastic sheet. It is said to have excellent properties for stressed applications in the electrical, chemical and appliance fields. Tensile strength is 19,000 psi; compressive, 24,000 psi; impact is 15 foot-pounds. It is resistant to acids, salts and mild alkalies as well as organic solvents.

Crystals Protect Metal Surfaces

USE REPLY CARD—CIRCLE No. 25

VPI crystals, developed by Shell Oil Co., New York 20, N. Y., prevent rust and corrosion of metal parts in the presence of air and moisture. Being slightly volatile at atmospheric temperatures, they give off vapors that are carried by convection and diffusion to all surfaces of the metal

"Standard"

Serves Manufacturers Who Use All Shapes and Sizes of

MECHANICAL STEEL TUBING

SIZE AND THICKNESS CHART

of Electric Weld Tubing for Mechanical Use

TUBE DIAMETER "O.D. SIZE	MAXIMUM WALL		MINIMUM WALL	
	DECIMAL	B. W. GAUGE	DECIMAL	B. W. GAUGE
1/2"	.065"	16	.028"	22
5/8"	.065"	16	.028"	22
3/4"	.065"	16	.028"	22
7/8"	.083"	14	.028"	22
1"	.109"	12	.028"	22
1 1/8"	.109"	12	.028"	22
1 1/4"	.134"	10	.028"	22
1 3/8"	.134"	10	.028"	22
1 1/2"	.148"	9	.035"	20
1 5/8"	.148"	9	.035"	20
1 3/4"	.148"	9	.035"	20
1 7/8"	.165"	8	.035"	20
2"	.165"	8	.035"	20
2 1/4"	.180"	8	.035"	20
2 1/2"	.203"	7	.035"	20
2 3/4"	.203"	6	.035"	20
3"	.220"	6	.035"	20
3 1/4"	.220"	5	.049"	20
3 1/2"	.238"	5	.049"	18
3 3/4"	.238"	4	.049"	18
3 7/8"	.238"	4	.049"	18
4"	.238"	4	.049"	18
4 1/4"	.238"	4	.049"	18
4 1/2"	.250"	4	.049"	18
4 3/4"	.250"	3	.065"	16
5"	.250"	3	.083"	14
5 1/2"	.180"	7	.083"	14
6"	.180"	7	.083"	14

Intermediate sizes within the range indicated can also be manufactured. Please consult us for sizes not listed.

THE STANDARD TUBE CO.

Detroit 28, Michigan

Welded Tubing — Fabricated Parts

ABOVE CHART COVERS ROUND CARBON STEEL TUBING . . .

•

EQUIVALENT SQUARES, RECTANGULARS AND SPECIAL SHAPES ARE ALSO AVAILABLE.

where they condense to provide a thin protective layer. Crystals also arrest corrosion at any advanced stage.

Two Pressure Sensitive Tapes

USE REPLY CARD—CIRCLE No. 26

Behr-Manning Corp., Troy, N. Y., has added two items to its line of Behr-Cat brand pressure sensitive tapes. No. 211 strapping tape is a glass filament reinforced tape designed for heavy duty service in the fields of strapping, packaging, banding and carton sealing. No. 113 masking tape is developed for masking off areas on anodized aluminum and magnesium as well as castings of these materials and their alloys, particularly where parts are to be subjected to high temperatures.

Electrical Metallic Tubing

USE REPLY CARD—CIRCLE No. 27

Samuel Moore & Co., Mantua, O., offers a plastic armored electrical metallic tubing for use where corrosive atmospheres necessitate frequent replacement of electrical conduit. An 0.020-inch coating of tough, corrosion-resistant vinyl or polyethylene plastic is extruded over standard galvanized electrical metallic tubing.

Saddle Stop Type Solenoid

USE REPLY CARD—CIRCLE No. 28

The 3K-300 saddle stop type solenoid, made by National Acme Co., Cleveland, O., introduces a leather faced retainer stop and hood arranged so as to act as guide and silencer to the plunger movement. It retains Stellite-Weld bonding of laminations of plunger at sides and point of impact. It is available in a variety of strokes for alternating or direct current, for base or side mounting.

Traps Mercury

USE REPLY CARD—CIRCLE No. 29

Mercureceiver, developed by Chemiquip Co., New York 29, N. Y., is designed to trap mercury blown from monometers and achieve equilibrium readings in 10 seconds or less. It also dampens surges and pulsations, filters actuating media and prevents loss of mercury at normal operating pressure.

Galvanometer System

USE REPLY CARD—CIRCLE No. 30

Type 1951 direct current galvanometer system, introduced by Shallcross Mfg. Co., Collingdale, Pa., has the coil and its mechanism mounted on sturdy rod supports and protected by removable aluminum cover. Panel mounting holes are standard. Units are available in four types.

Bimetal Disk Thermostat

USE REPLY CARD—CIRCLE No. 31

A quick make and break bimetal disk thermostat for defrost control and/or cycle termination and other applications in which moisture beads are a problem, is available from Stevens Mfg. Co. Inc., Mansfield, O. Featuring an electrically independent bimetal thermal element that eliminates artificial cycling or jitters, the unit is made in two styles.

Optical Indexing Table

USE REPLY CARD—CIRCLE No. 32

An indexing table designed to provide accuracy in use with milling machines, jig bores, die sinkers and similar machining for indexing and rotary milling is introduced by F. T. Griswold Mfg. Co., Wayne, Pa. It may be used in a vertical or horizontal position. A precision engraved glass degree scale is observed directly through a compact telescope which, in conjunction with circular dial,

IF IT'S MADE FROM
FLAT or ROUND STEEL
CUYAHOGA CAN MAKE IT!

FLAT SPRINGS
STAMPINGS
SNAP-CLIPS

Produced in any quantity... large production runs a specialty

SPRINGS and WIRE FORMS
•
Every Type Any Style
•
Custombuilt to fit your need

SUBSIDIARY OF Barium STEEL CORPORATION Steelwright to the Nation

The CUYAHOGA SPRING Co.
10200 BEREA ROAD • CLEVELAND 2, OHIO

New Tool Microhones

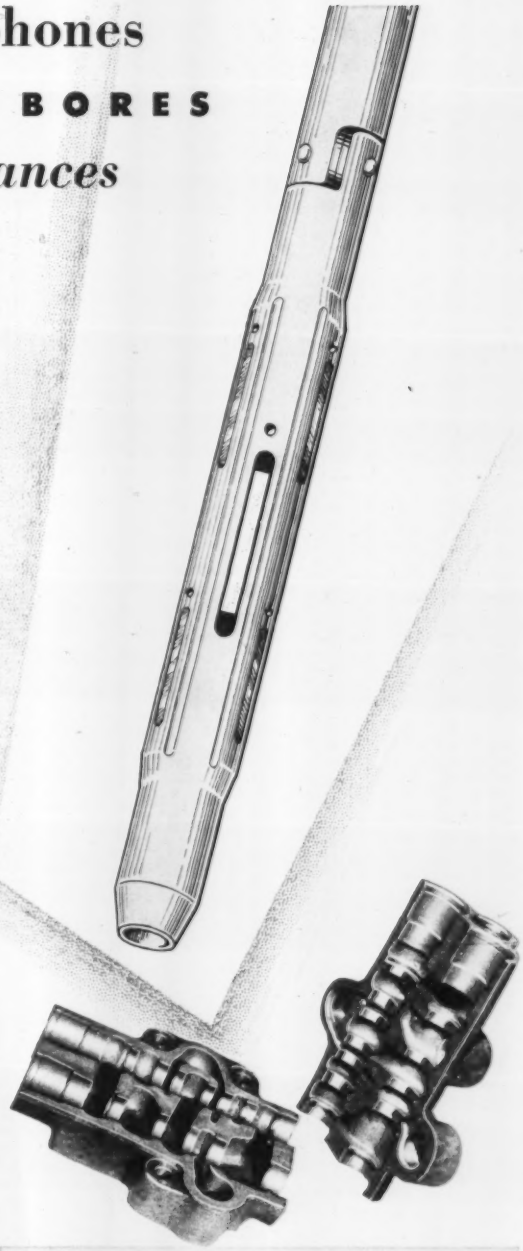
INTERRUPTED BORES

to precise tolerances

Plastic guides stabilize tool as abrasives cross keyways, undercuts, ports, reliefs, or cross holes.

The guides are forced out radially against the surface by the same cone (wedge) that applies pressure to the abrasives. The plastic wears down with the abrasive and keeps the abrasive generating a true cylinder without injurious over-cutting or breaking the edges of the interruptions in the surfaces.

Lands in cast iron hydraulic control panel held to .0002" for size, roundness, straightness and alignment. No lapping or selective fitting of spools is necessary. Holds 750 lbs. pressure without leakage or binding.



Write for issue of Cross Hatch describing MICROHONING of Interrupted Surfaces.

MICROMATIC HONE CORPORATION

8100 SCHOOLCRAFT AVENUE • DETROIT 4, MICHIGAN

District Field Offices: 1323 S. Santa Fe Avenue, Los Angeles 21, California • 206 S. Main Street, Rockford, Illinois • 231 S. Pendleton Avenue, Pendleton, Indiana • MICRO-MOLD Manufacturing Division, Boston Post Road, Guilford, Connecticut • 55 George Street, Brantford, Ontario, Canada

"It couldn't be done"

—but they're doing it on a Clearing

Here is a 225-ton Clearing press drawing seamless trays for strictly modern wheelbarrows in the Kent, Wash., plant of Northwest Metal Products, Inc. The tray is $5\frac{3}{16}$" deep at the back, $7\frac{1}{4}$" deep at the front, $25\frac{1}{4}$" wide and $32\frac{5}{16}$" long. Although it was said this draw could not be made without using special "automobile" steel, they're doing it in a single stroke—using commercial quality steel — on the Clearing in the picture.

Doing the "impossible" calls for men, methods and machines that are out of the ordinary. You can depend on Clearing presses for such jobs because, as so many top production men are well aware, Clearings aren't ordinary presses. We'll be glad to supply evidence of that fact at your request.

CLEARING MACHINE CORPORATION

6499 WEST 65TH STREET ★ CHICAGO 38, ILLINOIS

CMC CLEARING

CLEARING PRESSES

THE WAY TO EFFICIENT MASS PRODUCTION

makes possible readings accurate to 0.0005-inch at periphery of 12-inch circle.

Ratchet Screwdrivers

USE REPLY CARD—CIRCLE No. 33

Kipton Industries, Norwalk, O., announces a line of Palm-Grip ratchet screwdrivers with three position, standard $\frac{3}{8}$-inch drive ratchet that can be changed with a flick of the finger. Design of tool permits direct, even pressure and maximum leverage on each application. They are available with regular, Phillips and clutch head blades.

Speeds Barrel Finishing

USE REPLY CARD—CIRCLE No. 34

Steel finishing compound No. C-5, developed by Blue Magic Chemical Specialties Co., Philadelphia 24, Pa., is a special purpose chemical compound for barrel finishing alloy steel parts in minimum time. It is a nondusting, soapy, concentrated powder that has no obnoxious odor and is not irritating to the skin.

Resin Core Solder

USE REPLY CARD—CIRCLE No. 35

A highly active resin flux, known as 44 resin, is announced by Kester Solder Co., Chicago 39, Ill., for fast soldering. It melts, wets the metal and flows or spreads all in one instantaneous action. It is noncorrosive and electrically nonconductive.

Collet Closing Attachment

USE REPLY CARD—CIRCLE No. 36

A toolroom type collet closing attachment is offered by Crozier Machine Tool Co., Hawthorne, Calif. All wearing parts are hardened and the handwheel is self-centering on the spindle. It is available in three models.

Resistance Welding Electrode

USE REPLY CARD—CIRCLE No. 37

Designated as Kaptrode, a resistance welding electrode is introduced by Weiger Weed & Co., Detroit 4, Mich. It consists of an expendable

USE A **REPLY CARD**

Just circle the corresponding number of any item in this section for more information.

Helpful Literature

73. Industrial Equipment

Clark Equipment Co.—32-page illustrated pocket-size booklet "How the Products of Clark Serve Industry" contains brief descriptions of company's products which include axles and transmissions, forged one-piece axle housings, gears and forgings. Also covered are industrial towing tractors, fork-lift trucks and attachments, powered hand trucks and stackers.

74. Paper-Dielectric Capacitors

General Electric Co.—Operation and features of fixed paper-dielectric capacitors are described in 16-page booklet GEC-809. Capacitors, made in voltage range from 236 to 660 v ac and 400 to 1500 v dc, are dual-rated.

75. Saw Blades & Pipe Tools

Capewell Mfg. Co.—Brief descriptions and prices on complete line of hand and power hack saw blades, metal and wood cutting band saws, band knives, Armstrong-Bridgeport pipe fitters' hand tools, pipe and bolt threading machines, hammers, ground flat stock, foundry nails and horse nails are contained in loose-leaf catalog "Capewell Products." Price sheets show both suggested resale and distributor's net prices.

76. Recording Oscillograph

Century Geophysical Corp.—Operating features and application data on model 408 recording oscillograph are presented in 2-page illustrated bulletin CGC-302. This equipment is designed expressly for mobile and airborne operation.

77. Antirust Wrapping

Nox-Rust Chemical Corp.—18-page illustrated pamphlet "Nox-Rust Vapor Wrapper 'How' Book" presents data on company's corrosion-preventive vapor wrapping for metal parts and machinery. Applications used by other companies are shown, and grades and length of wrapping are tabulated. Rules for getting best wrapping results are listed.

78. Tube Cleaners

Elliott Co., Lagonda Div.—26-page illustrated bulletin Y-29 shows and describes representative types of cleaners, motors, cutter heads and accessories used to clean and descale tubes and pipes. Covered are air, steam, water and electric driven equipment for straight or curved tubes. Tabulated tube and pipe sizes are included.

79. Brass Nuts

Fischer Special Mfg. Co.—Styles, specifications and part numbers of standard line of brass nuts, odd size nuts, spark plug terminals, battery nuts and lighting fixture nuts are detailed in 15-page booklet "The Fischer File of Fischer Turned Brass Nuts." Drawings on all styles are shown.

80. Gear Hobber

Hamilton Tool Co.—6-page illustrated supplement H 1-49 gives information on hob speed, indexing and helix change gears; arrangement for bevel gear hobbing; and work holding fixture for use with No. 1 precision hobber.

81. Abrasive Wheels & Shapes

Lamb Rubber Corp. — Various grades of Whirlaway rubber-bonded abrasive wheels and shapes for grinding, finishing deburring or edge-breaking are described in 6-page folder. Tips are given on shaping and dressing, breaking in, mounting and speeds to use.

82. Defense Heat Treating

E. F. Houghton & Co.—Factual 52-page illustrated booklet is based on defense production experience in heat treating and metal working operations involved in producing shells, rockets, guns, aircraft parts and other defense items. Entitled "Defense Production Data from the Houghton Line," it explains many manufacturing steps in accurate detail.

83. Lubricants

Keystone Lubricating Co.—20-page illustrated bulletin BK-19 gives details on seven specialized lubricants for ball and roller bearings, plain and ring bearings, open and enclosed gears, speed reducers, as well as oils for cleaning, loosening and penetrating. Characteristics, uses, densities, specifications and container sizes are covered.

84. Tractor Shovels

Frank G. Hough Co.—Bulk material handling applications of Payloader tractor shovels in many kinds of plants are revealed in 12-page illustrated brochure No. 205. List of users plus job studies and performance data from certain applications are included.

85. Centrifugal Castings

Sandusky Foundry & Machine Co. —"40 Years of Leadership in Centrifugal Castings" is title of 4-page bulletin 542 which is descriptive of centrifugal castings made in diameters from 3 to 54 in. and in lengths up to 327 in. Nonferrous compositions available in these castings are tabulated.

FOR MORE INFORMATION USE ONE OF THESE CARDS . . .

FIRST CLASS
PERMIT No. 36
(Sec. 34.9 P.L.&R.)
Cleveland, Ohio

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No Postage Stamp Necessary if Mailed in the United States

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7	27	47	67	87
8	28	48	68	88
9	29	49	69	89
10	30	50	70	90
11	31	51	71	91
12	32	52	72	92
13	33	53	73	93
14	34	54	74	94
15	35	55	75	95
16	36	56	76	96
17	37	57	77	97
18	38	58	78	98
19	39	59	79	99
20	40	60	80	100

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COMPANY _____

PRODUCTS MANUFACTURED _____

ADDRESS _____

CITY and ZONE _____ STATE _____

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86. Coal Handling Equipment

Link-Belt Co.—40-page book No. 2410 contains layout drawings and photographs of actual installation of coal and ash handling equipment. Pictures show installations at large and small power plants. Sections deal with unloading coal, auxiliary unloading, coal storage and reclaiming, crushers, transporting and distributing, ash handling and water intake screens.

87. Castable Refractories

Laclede-Christy Co. — Features, characteristics and uses of various types of castable refractories of hydraulic setting form are covered in 12-page illustrated booklet No. 41. Line drawing of installations, metal and refractory anchors, physical characteristics and suggested applications are included.

88. Liquid Level Controllers

Minneapolis-Honeywell Regulator Co.—Data on sizes, construction, materials, ratings and mounting dimensions pertinent to internal float and external float cage liquid level controllers used in surge tanks, stills, towers and feedwater heaters are covered in Specification Sheet 412-2.

89. Heat Treat Furnaces

Loftus Engineering Corp.—12-page brochure "Proven Heat-Treating Efficiency" shows customer plants equipped with various heat treat furnaces. Pictured are wire furnaces; continuous heat treat lines; shuffle-hearth furnaces; roller-hearth and car-type furnaces; and shell, rocket and cartridge case furnaces.

90. Freight Car Loading Methods

General American-Evans Co.—44-page illustrated GAEX "Operations Manual" describes features incorporated into GAEX freight car and graphically illustrates correct loading and unloading procedures for various types of shipments. What makes damage, details of damage-free loading device, systematic unloading and seven typical loads are among subjects covered.

91. Synclinal Filter

Marvel Engineering Co.—Complete engineering data on synclinal type filters for sump or line installation on all hydraulic and low pressure liquid recirculating systems is contained in 8-page folder 105. Single unit capacity sizes are available from 5 to 100 gpm, filter mesh from 30 to 200.

92. Air & Hydraulic Cylinders

Ortman Miller Machine Co.—28-page diagrammed bulletin No. 101 on O-M air, hydraulic and water cylinders contains specifications, data on internal locking system and listing of parts. Information covers standard, oversize and 2-1 piston rods.

93. Descaling Salt

Hooker Electrochemical Co. — Details of Hooker process for descaling variety of metal products and desanding castings are given in 8-page illustrated bulletin 25 with 2-page supplement. Process uses Virgo descaling salt.

94. Production Facilities

Lyon Metal Products Inc.—"Lyon for Sheet Metal Defense Production" is title of 4-page folder picturing company facilities as well as a few typical examples of items produced to fill World War II contracts. Machines and equipment are listed.

95. Steel Tubing

Higbie Mfg. Co., Avon Tube Div.—Characteristics and features of Fusion-weld steel tubing are provided in 12-page illustrated bulletin. Company's fabricating service, specifications for tubing and some uses of tubing are found in bulletin.

96. Automatic Lathe

Jones & Lamson Machine Co.— 20-page illustrated catalog No. 202 is descriptive of the 8-in. Fay automatic lathe. Photos show features, parts and component assemblies of this machine which has eight speed ranges, from 87 to 1610 rpm.

97. Polyethylene Flame-Spray

Linde Air Products Co.—"For Corrosion Resistance—Flame-Spray with Polyethylene" is title of 8-page illustrated booklet which discusses necessary equipment, plate preparation, application technique and safety precautions.

98. Drill Jig Bushings

W. F. Meyers Co. — Tabulated size listings of Meyco carbide-inserted fixed renewable and slip renewable bushings as well as headless liners and lock screws can be found in 6-page folder. Drill sizes, decimal equivalents and tap drill sizes are also given.

99. Microphotometers

Jarrell-Ash Co. — Recording and nonrecording comparator microphotometers are described, and features and advantages outlined in 12-page illustrated catalog M10-51. Also contained in catalog are specifications and data on accessories.

100. Power Screwdriver Bits

Ludwig Hommel & Co.—Descriptive and specifications folder entitled "Power Screw Driver Bits" presents sizes and styles in line which consists of ¼-in. hex drive and threaded shank drive bits for slotted, Phillips and Frearson (Reed & Prince) screws.

FOR MORE INFORMATION USE ONE OF THESE CARDS . . .

STEEL Numbers				
1	21	41	61	81
2	22	42	62	82
3	23	43	63	83
4	24	44	64	84
5	25	45	65	85
6	26	46	66	86
7	27	47	67	87
8	28	48	68	88
9	29	49	69	89
10	30	50	70	90
11	31	51	71	91
12	32	52	72	92
13	33	53	73	93
14	34	54	74	94
15	35	55	75	95
16	36	56	76	96
17	37	57	77	97
18	38	58	78	98
19	39	59	79	99
20	40	60	80	100

STEEL 12-3-51

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cap that fits into a semipermanent adapter shank which then fits into standard Morse taper type electrode holder. Electrode is made in six nose styles, in three RWMA alloys and two Morse taper sizes.

Cable Support and Conduit Seal

USE REPLY CARD—CIRCLE No. 38

Wedgelock support, a cable support and conduit seal, is introduced by Adalet Mfg. Co., Cleveland 11, O. It provides for extensions and horizontal installations. For outdoor use, fitting is equipped with an aluminum alloy body that will not rust and for single-phase circuits is nonmagnetic.

Goggle Has Leather Shields

USE REPLY CARD—CIRCLE No. 39

A welder's goggle featuring removable and adjustable bind-type leather side shields is offered by American Optical Co., Southbridge, Mass. It can be adjusted for perfect fit and maximum comfort by loosening endpiece screws. By removing endpiece screws, side shields can be taken off for cleaning or replacing.

With Interchangeable Mountings

USE REPLY CARD—CIRCLE No. 40

Interchangeable mountings are features in the Web-Aire cylinder announced by H. G. Weber & Co. Inc., Kiel, Wis. It is available with foot-mounted and clevise-mounted adapters. Unit has a threaded piston end and steel head with interchangeable bronze bushings.

Carries Precision Parts

USE REPLY CARD—CIRCLE No. 41

Eezy-Stak wire basket, made by Wire & Iron Products Inc., Detroit 16, Mich., will carry precision parts through all phases of manufacturing, including plating, drying, washing and machining. It consists of a metal frame and custom-made inserts that will handle any shape or material. Baskets are made of 1/8-1/4-inch and 5/16-inch steel wire, 1/4-1/2-inch and 3/4-inch flat expanded metal or wire mesh or perforated metal.

USE A
REPLY CARD
Just circle the corresponding number of any item in this section for more information.

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Oxygen
FROM AIR
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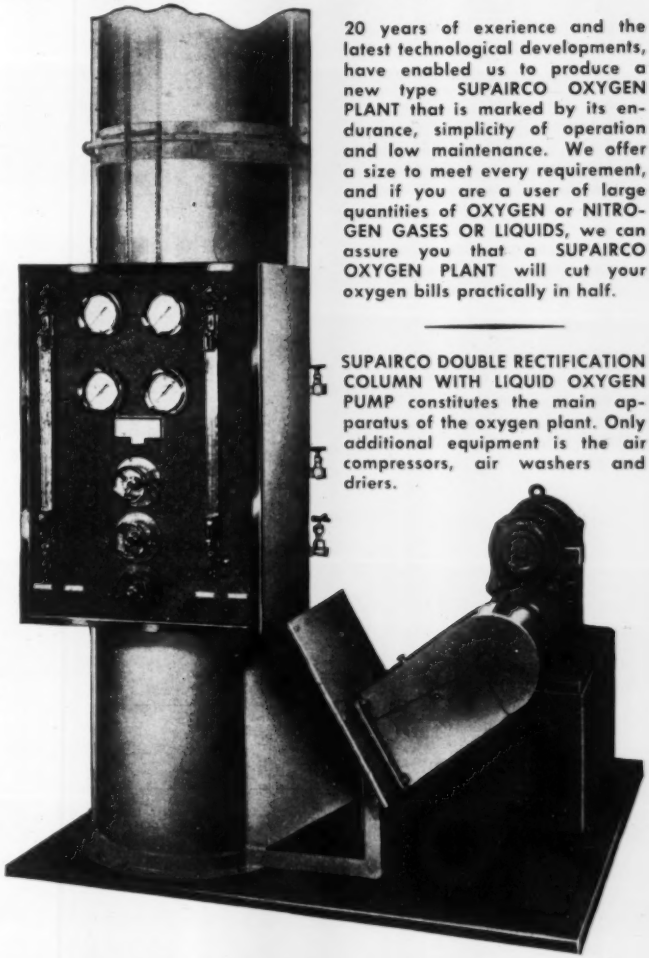


20 years of exerience and the latest technological developments, have enabled us to produce a new type SUPAIRCO OXYGEN PLANT that is marked by its endurance, simplicity of operation and low maintenance. We offer a size to meet every requirement, and if you are a user of large quantities of OXYGEN or NITROGEN GASES OR LIQUIDS, we can assure you that a SUPAIRCO OXYGEN PLANT will cut your oxygen bills practically in half.

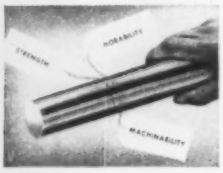
SUPAIRCO DOUBLE RECTIFICATION COLUMN WITH LIQUID OXYGEN PUMP constitutes the main apparatus of the oxygen plant. Only additional equipment is the air compressors, air washers and driers.

SUPERIOR AIR PRODUCTS CO.
128 MALVERN STREET • NEWARK 5, N. J., U. S. A.
Also Manufacturers of Plants and Apparatus for Liquid Air, Liquid Oxygen, Liquid Nitrogen and Containers and Flasks for Liquefied Gases.

DISCOVERED:

how to fill a parts bin faster with present machinery

A new "baby" fights sulphuric acid: A few years ago industry indicated the need for a new stainless steel, to resist sulphuric acid, that could be produced in bar, strip, tube and other forms. **A•E•S**ervice came up with the answer: Stainless No. 20. Once again, Carpenter customers were *first* to cash-in on new, improved Stainless products.



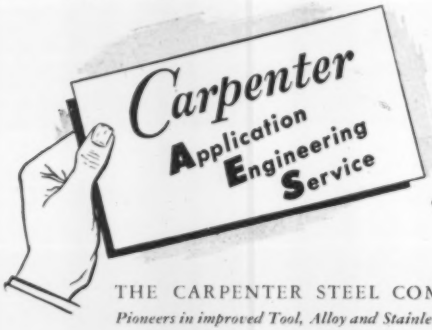
The first "3-in-1" package: To speed moldmaking and improve molding results, the plastic industry had long sought a mold steel that combined all 3: Easy hobbing, good machinability, high strength. **A•E•S**ervice worked again for Carpenter customers—came up with Samson Extra, the first of its kind.

Yours may be one of the plants that is finding ways to produce more from present machinery, through Carpenter's **A**pplication **E**ngineering **S**ervice.

A•E•Service is Carpenter's way of helping its customers apply specialty steels to squeeze maximum output from existing facilities. And in the process, it goes further to simplify production methods, lower break-even points, and increase a product's worth. Actually, there's no "mystery" to the way **A•E•S**ervice works. It works because it packs more imagination and sweat into every application it tackles. That's why the Carpenter man digs for facts on each job . . . studies previous records . . . "lives" with the application 'til it's a success. He's after all the data he can get to apply the one steel best fitted to perform better.

This may require the talents of many men. If so, the Carpenter man calls in a field engineer, or draws on the added experience of his teammates in the Mill laboratory. And if trends in industry indicate the need for a new steel, that's a job for **A•E•S**ervice, too. In fact, Carpenter customers often pace their fields with dramatically new or improved products that stem from steels born in Carpenter laboratories.

A•E•Service is all this. And it is *continuing* to grow in value for those it serves.



keeps you ahead of competition

THE CARPENTER STEEL COMPANY • READING, PA.

Pioneers in improved Tool, Alloy and Stainless Steels through continuing research

The Market Outlook

DEMAND pressure on the steel mills continues as strong as ever. Slack arising from cutbacks in consumer durable goods is being offset by expanding defense requirements. Mills are booked virtually full for first quarter despite smaller allotments on civilian goods account. Carryover tonnage from fourth quarter will be substantial in all the major products, especially plates, structurals and bars. Consequently, there seems little likelihood of any easing in supply conditions before second quarter at earliest.

SOFT SPOTS— Many soft spots in demand now apparent will disappear early in the first quarter. Diversion of continuous mill rolling time to production of light plates on a larger scale will take up considerable of the slack now developing in the light, flat-rolled products. Further, since the soft spots largely stem from cutbacks in steel and other metal allotments to civilian goods with attending dislocations and curtailments in manufacturing schedules, affected manufacturers are likely to intensify their efforts to get into defense work.

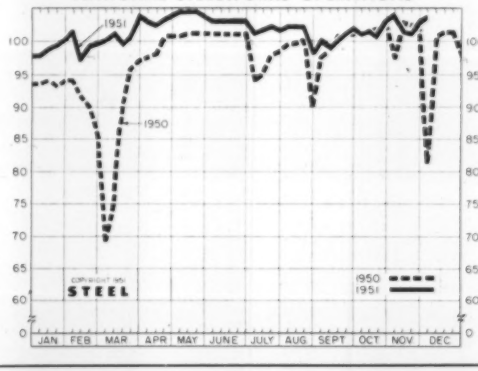
ALLOTMENTS— Revisions in allotments of steel, copper products and aluminum to some government claimant agencies for production and construction in first quarter were announced last week. The changes provide additional controlled materials to the Federal Security Agency for construction of schools and hospitals, the Atomic Energy Commission for important projects, the Defense Electric Power Administration for transmission lines, and the Department of Defense for urgent production programs. Minor adjustments also were made to provide additional materials for other programs, including the Federal Civil Defense Agency, and the electrical equipment, metalworking and mining equipment divisions of the National Production Authority. The additional allotments will come from the DPA reserve set up when first quarter allotments were made early last month. Beginning second quarter about 15,000 additional small users of controlled materials will be relieved of the necessity of filing applications for allotments. Manufacturers of class B products will be able to self-certify their orders if their quarterly requirements do not exceed 30 tons of carbon steel, 8 tons of alloy steel, 1500 pounds of stainless, 3000 pounds of copper and copper base alloy, and 2000 pounds of aluminum.

SCRAP— Threat of scrap shortage this winter is increasingly disturbing despite the more optimistic view held in government circles as result of a survey of 165 steel mills which showed stocks of purchased scrap up to 45 days' supply from April's low point of 36 days. Critically low stocks of scrap are reported by some mills, including large works in the Pittsburgh area, and it is apparent widespread allocation of tonnage to distress points will have to be continued through the winter if sharp production curtailments are to be averted. Larger use of pig iron may be necessary over coming months to offset the scrap shortage. In this connection iron ore stocks are reported adequate to support high-level blast furnace production through the winter. The Great Lakes shipping season is rapidly nearing a close but shippers expect to meet their season shipment goal of about 90 million tons of iron ore by the time weather makes further lakes traffic impossible. Up to Nov. 26 ore shipments totaled 87,617,760 tons.

PRODUCTION— Steelmaking operations increased last week, the national ingot rate rising ½ point to 103.5 per cent of capacity. This is equivalent to production of about 2,070,000 net tons of ingots and steel for castings. Operations in the like week last year were hampered by a crippling snow storm, dropping to around 81.5 per cent.

PRICES— Except for new regulations covering steel warehouse prices, the iron and steel markets are unchanged pricewise. Revisions in mill schedules, if any, are unlikely pending completion of steel wage negotiations which got under way last week. Under the new warehouse regulations, distributors' prices will be established by a formula which includes percentage markups on the various products over mill quotations.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended Dec. 1	Change	Same Week 1950	Same Week 1949
Pittsburgh	100	— 3*	53	88
Chicago	107	+ 0.5*	104	92.5
Mid-Atlantic	101.5	+ 0.5	98	82
Youngstown	106	0	40	95
Wheeling	99.5	+ 0.5	94	99
Cleveland	103	— 1*	78.5	93.5
Buffalo	104	0	104	101
Birmingham	105	+ 5	100	100
New England	91	+ 1	88	89
Cincinnati	102	— 1	100	70
St. Louis	93.5	+ 2	90.5	84.5
Detroit	106	+ 4.5*	102	101
Western	107	+ 5	101	82
Estimated national rate	103.5	+ 0.5	81.5	89.5

Based on weekly steelmaking capacity of 1,999,034 tons for 1951; 1,928,721 tons for second half, 1950; 1,906,268 tons for first half, 1950; 1,843,516 tons for 1949.

* Change from revised rate for preceding week.

The Metalworking Outlook—p. 45 *Production-Engineering News—p. 81*

Composite Market Averages

FINISHED STEEL INDEX, Weighted:

	Nov. 29 1951	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100)	171.92	171.92	171.92	157.76	112.04
Index in cents per lb.	4.657	4.657	4.657	4.274	3.035
ARITHMETICAL PRICE COMPOSITES:					
Finished Steel, NT	$106.32	$106.32	$106.32	$95.09	$64.45
No. 2 Fdry, Pig Iron, GT	52.54	52.54	52.54	49.54	28.17
Basic Pig Iron, GT	52.16	52.16	52.16	49.04	27.50
Malleable Pig Iron, GT	53.27	53.27	53.27	50.27	28.79
Steelmaking Scrap, GT	43.00	43.00	43.00	41.00	24.17

Weighted finished steel index based on average shipments and Pittsburgh district prices of the following 14 representative products during 5-year base period 1935-39: Structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-rolled strip. For complete explanation see STEEL, Sept. 19, 1949, p. 54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold-finished bars, galvanized sheets and hot-rolled strip.

Basic and No. 2 foundry pig iron composites are based on average prices at Pittsburgh, Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown. Malleable composite based on same points except Birmingham.

Steelmaking scrap composite based on average prices of No. 1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS

	Nov. 29 1951	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	3.70	3.70	3.70	3.45	2.50
Bars, H.R., Chicago	3.70	3.70	3.70	3.45	2.50
Bars, H.R., del. Philadelphia	4.223	4.223	4.223	3.93	2.86
Bars, C.F., Pittsburgh	4.55	4.55	4.55	4.15	3.10
Shapes, Std., Pittsburgh	3.65	3.65	3.65	3.40	2.35
Shapes, Std., Chicago	3.65	3.65	3.65	3.40	2.35
Shapes, del. Philadelphia	3.918	3.918	3.918	3.46	2.48
Plates, Pittsburgh	3.70	3.70	3.70	3.50	2.50
Plates, Chicago	3.70	3.70	3.70	3.50	2.50
Plates, Coatesville, Pa.	4.15	4.15	4.15	3.90	2.50
Plates, Sparrows Point, Md.	3.70	3.70	3.70	3.50	2.50
Plates, Claymont, Del.	4.15	4.15	4.15	3.90	2.50
Sheets, H.R., Pittsburgh	3.60–75	3.60–75	3.60–75	3.35	2.425
Sheets, H.R., Chicago	3.60	3.60	3.60	3.35	2.425
Sheets, C.R., Pittsburgh	4.35	4.35	4.35	4.10	3.275
Sheets, C.R., Chicago	4.35	4.35	4.35	4.10	3.275
Sheets, C.R., Detroit	4.55	4.55	4.55	4.30	3.41
Sheets, Galv., Pittsburgh	4.80	4.80	4.80	4.40	4.05
Strip, H.R., Pittsburgh	3.75-4.00	3.75-4.00	3.75-4.00	3.50-3.75	2.35
Strip, H.R., Chicago	3.50	3.50	3.50	3.25	2.35
Strip, C.R., Pittsburgh	4.65-5.35	4.65-5.35	4.65-5.35	4.15-4.85	3.05
Strip, C.R., Chicago	4.90	4.90	4.90	4.30	3.15
Strip, C.R., Detroit	4.85-5.60	4.85-5.60	4.85-5.60	4.35-5.10	3.185
Wire, Basic, Pittsburgh	4.85-5.10	4.85-5.10	4.85-5.10	4.50-4.75	3.05
Nails, Wire, Pittsburgh	5.90-6.20	5.90-6.20	5.90-6.20	5.30-5.60	3.75
Tin plate, box, Pittsburgh	$8.70	$8.70	$8.70	$7.50	$5.25

SEMIFINISHED

Billets, forging, Pitts. (NT)	$66.00	$66.00	$66.00	$63.00	$47.00
Wire rods, ½-⅝", Pitts.	4.10–30	4.10–30	4.10–30	3.85	2.30

PIG IRON, Gross Ton

Bessemer, Pitts.	$53.00	$53.00	$53.00	$50.00	$29.00
Basic Valley	52.00	52.00	52.00	49.00	28.00
Basic, del. Phila.	56.61	56.61	56.61	53.39	29.93
No. 2 Fdry, Pitts.	52.50	52.50	52.50	49.50	28.50
No. 2 Fdry, Chicago	52.50	52.50	52.50	49.50	28.50
No. 2 Fdry, Valley	52.50	52.50	52.50	49.50	28.50
No. 2 Fdry, Del. Phila.	57.11	57.11	57.11	53.89	30.43
No. 2 Fdry, Birm.	48.88	48.88	48.88	45.88	24.88
No. 2 Fdry (Birm.) del. Cin.	55.49	55.49	55.49	52.58	28.94
Malleable Valley	52.50	52.50	52.50	49.50	28.50
Malleable, Chicago	52.50	52.50	52.50	49.50	28.50
Charcoal, Lyles, Tenn.	66.00	66.00	66.00	62.00	33.00
Ferromanganese, Etna, Pa.	188.00	188.00	188.00	175.00	140.00*

* Delivered, Pittsburgh.

SCRAP, Gross Ton (including broker's commission)

No. 1 Heavy Melt, Pitts.	$44.00	$44.00	$44.00	$44.00	$25.00
No. 1 Heavy Melt, E. Pa.	42.50	42.50	42.50	39.00	24.00
No. 1 Heavy Melt, Chicago	42.50	42.50	42.50	40.00	23.75
No. 1 Heavy Melt, Valley	44.00	44.00	44.00	43.75	25.00
No. 1 Heavy Melt, Cleve.	43.00	43.00	43.00	43.25	24.50
No. 1 Heavy Melt, Buffalo	43.00	43.00	43.00	41.50	24.25
Rails, Rerolling, Chicago	52.50	52.50	52.50	65.50	27.25
No. 1 Cast, Chicago	49.00*	49.00*	49.00*	61.00	35.00*

* F.o.b. shipping point.

COKE, Net Ton

Beehive, Furn. Connisvl.	$14.75	$14.75	$14.75	$14.25	$8.75
Beehive, Fdry., Connisvl.	17.50	17.50	17.50	16.50	9.50
Oven Fdry., Chicago	23.00	23.00	23.00	21.00	14.35

NONFERROUS METALS

Copper, del. Conn.	24.50	24.50	24.50	24.50	19.50
Zinc, E. St. Louis	19.50	19.50	19.50	17.50	10.50
Lead, St. Louis	18.80	18.80	18.80	16.80	11.65
Tin, New York	103.00	103.00	103.00	141.00	70.00
Aluminum, del.	19.00	19.00	19.00	19.00	15.00
Antimony, Laredo, Tex.	50.00	50.00	42.00	32.00	23.50
Nickel, refinery, duty paid	56.50	56.50	56.50	48.00	38.50

PIG IRON

F.o.b. furnace prices quoted under GCPR as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax. Key to producing companies published on second following page.

PIG IRON, Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa. B2	$54.00	$54.50	$55.00	$55.50
Brooklyn, N.Y., del.	....	59.18	59.68	....
Newark, del.	56.87	57.37	57.87	58.37
Philadelphia, del.	56.61	57.11	57.61	58.11
Birmingham District				
AlabamaCity, Ala. R2	48.38	48.88	....	....
Birmingham R2	48.38	48.88	....	....
Birmingham S9	48.38	48.88	....	....
Woodward, Ala. W15	48.38	48.88	....	....
Cincinnati, del.	....	55.49	....	....
Buffalo District				
Buffalo R2	52.00	52.50	53.00	....
Buffalo H1	52.00	52.50	53.00	....
Tonawanda, N.Y. W12	52.00	52.50	53.00	....
No. Tonawanda, N.Y. T9	....	52.50	53.00	....
Boston, del.	62.11	62.61	63.11	....
Rochester, N.Y., del.	54.88	55.38	55.88	....
Syracuse, N.Y., del.	55.91	56.41	56.91	....
Chicago District				
Chicago I-3	52.00	52.50	52.50	53.00
Gary, Ind. U5	52.00	....	52.50	....
IndianaHarbor, Ind. I-2	52.00	....	52.50	....
So. Chicago, Ill. W14	52.00	52.50	52.50	....
So. Chicago, Ill. Y1	52.00	52.50	52.50	....
So. Chicago, Ill. U5	52.00	....	52.50	53.00
Milwaukee, del.	54.06	54.56	54.56	55.06
Muskegon, Mich., del.	....	58.47	58.47	....
Cleveland District				
Cleveland A7	52.00	52.50	52.50	53.00
Cleveland R2	52.00	52.50	52.50	....
Akron, O., del. from Cleve.	54.61	55.11	55.11	55.61
Lorain, O. N3	52.00	....	....	53.00
Duluth I-3	....	....	52.50	....
Erie, Pa. I-3	52.00	52.50	52.50	53.00
Everett, Mass. E1	....	57.00	57.50	....
Fontana, Calif. K1	58.00	58.50	....	....
Geneva, Utah G1	52.00	52.50	....	....
Seattle, Tacoma, Wash., del.	....	60.66	....	....
Portland, Oreg., del.	....	60.66	....	....
LosAngeles, SanFrancisco, del.	60.16	60.66	....	....
GraniteCity, Ill. G4	53.90	54.40	54.90	....
St. Louis, del. (inc. tax)	54.66	55.16	55.66	....
Ironton, Utah C11	52.00	52.50	....	....
LoneStar, Tex. L6	48.00	*48.50	48.50	....
Minnequa, Colo. C10	54.00	55.00	55.00	....
Pittsburgh District				
NevilleIsland, Pa. P6	....	52.50	52.50	53.00
Pitts., N.&S. sides, Ambridge, Aliquippa, del.	....	53.80	53.80	54.30
McKeesRocks, del.	....	53.54	53.54	54.04
Lawrenceville, Homestead, McKeesport, Monaca, del.	....	54.07	54.07	54.57
Verona, del.	....	54.57	54.57	55.07
Brackenridge, del.	....	54.82	54.82	55.32
Bessemer, Pa. U5	52.00	....	52.50	53.00
Clairton, Rankin, So. Duquesne, Pa. U5	52.00	....	....	....
McKeesport, Pa. N3	52.00	....	....	53.00
Monessen, Pa. P7	54.00	....	....	....
Sharpsville, Pa. S6	....	....	52.50	53.00
Steelton, Pa. B2	54.00	54.50	55.00	55.50
Swedeland, Pa. A3	56.00	56.50	57.00	57.50
Toledo, O. I-3	52.00	52.50	52.50	53.00
Cincinnati, del.	57.47	57.97	....	....
Troy, N.Y. R2	54.00	54.50	55.00	55.50
Youngstown District				
Hubbard, O. Y1	52.00	52.50	52.50	....
Youngstown Y1	52.00	52.50	52.50	....
Youngstown U5	52.00	....	....	53.00
Mansfield, O., del.	56.65	57.15	57.15	57.65

* Low phos, southern grade.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1.50 for each 0.5% Si)

Jackson, O. G2, J1	$62.50
Buffalo H1	63.75

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 for each 0.045% max. P)

NiagaraFalls, N.Y. P15	$88.00
Keokuk, Iowa, Openhearth & Fdry, frt. allowed K2	92.50
Keokuk, OH & Fdry., 12½ lb piglets, 16% Si, frt. allowed K2	95.50
Wenatchee, Wash., O.H. & Fdry., frt. allowed K2	92.50

CHARCOAL PIG IRON, Gross Ton

(Low phos semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles, Tenn. T3	$66.00

LOW PHOSPHOROUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$57.00
Steelton, Pa. B2	60.00
Philadelphia delivered	63.37
Troy, N.Y. R2	60.00

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Semifinished and Finished Steel Products

Mill prices quoted under GCPR as reported to STEEL, Nov. 29, 1951; cents per pound except as otherwise noted. Changes shown in Italics. Code numbers following mill points indicate producing company; key on next two pages

INGOTS, Carbon, Forging (NT)
Fontana,Calif. K1 ....$79.00
Munhall,Pa. U5 ....52.00

INGOTS, Alloy (NT)
Detroit R7 ....$54.00
Fontana,Calif. K1 ....80.00
Houston,Tex. S5 ....62.00
Midland,Pa. C18 ....54.00
Munhall,Pa. U5 ....54.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 ....$56.00
Clairton,Pa. U5 ....56.00
Ensley,Ala. T2 ....56.00
Fairfield,Ala. T2 ....56.00
Fontana,Calif. K1 ....75.00
Gary,Ind. U5 ....56.00
Johnstown,Pa. B2 ....56.00
Lackawanna,N.Y., B2 ....56.00
Munhall,Pa. U5 ....56.00
So.Chicago,Ill. U5 ....56.00
So.Duquesne,Pa. U5 ....56.00

Carbon, Forging (NT)
Bessemer, Pa. U5 ....$66.00
Buffalo R2 ....66.00
Canton,O. R2 ....66.00
Clairton,Pa. U5 ....66.00
Cleveland R2 ....66.00
Conshohocken,Pa. A3 ....73.00
Detroit R7 ....69.00
Ensley,Ala. T2 ....66.00
Fairfield,Ala. T2 ....66.00
Fontana,Calif. K1 ....85.00
Gary,Ind. U5 ....66.00
Geneva,Utah G1 ....66.00
Houston,Tex. S5 ....74.00
Johnstown,Pa. B2 ....66.00
Lackawanna,N.Y. B2 ....66.00
LosAngeles B3 ....85.00
Munhall,Pa. U5 ....66.00
Seattle B3 ....85.00
So.Chicago R2,U5,W14 ....66.00
So.Duquesne,Pa. U5 ....66.00
So.SanFrancisco B3 ....85.00

Alloy, Forging (NT)
Bethlehem,Pa. B2 ....$70.00
Buffalo R2 ....70.00
Canton,O. R2 ....70.00
Canton,O.(29) T7 ....66.00
Conshohocken,Pa. A3 ....77.00
Detroit R7 ....73.00
Fontana,Calif. K1 ....89.00
Gary,Ind. U5 ....70.00
Houston,Tex. S5 ....78.00
Ind.Harbor,Ind. Y1 ....70.00
Johnstown,Pa. B2 ....70.00
Lackawanna,N.Y. B2 ....70.00
LosAngeles B3 ....90.00
Massillon,O. R2 ....70.00
Midland,Pa. C18 ....70.00
Munhall,Pa. U5 ....70.00
So.Chicago R2,U5,W14 ....70.00
So.Duquesne,Pa. U5 ....70.00
Struthers,O. Y1 ....70.00
Warren,O. C17 ....70.00

ROUNDS, SEAMLESS TUBE (NT)
Canton,O. R2 ....$82.00
Cleveland R2 ....82.00
Fontana,Calif. K1 ....103.00
Gary,Ind. U5 ....82.00
Massillon,O. R2 ....82.00
So.Chicago,Ill. R2 ....82.00
So.Duquesne,Pa. U5 ....82.00

SHEET BARS (NT)
Fontana,Calif. K1 ....$89.00

SKELP
Aliquippa,Pa. J5 ....$3.45
Munhall,Pa. U5 ....3.35
Warren,O. R2 ....3.35
Youngstown R2, U5 ....3.35

WIRE RODS
Alton,Ill. L1 ....4.40
AlabamaCity,Ala. R2 ....4.10
Buffalo W12 ....4.10
Cleveland A7 ....4.10
Donora,Pa. A7 ....4.10
Fairfield,Ala. T2 ....4.10
Fontana,Calif. K1 ....4.90
Houston,Tex. S5 ....4.10
Johnstown,Pa. B2 ....4.10
Joliet,Ill. A7 ....4.10
LosAngeles B3 ....4.90
Minnequa,Colo. C10 ....4.35
Monessen,Pa. P7 ....4.30
No.Tonawanda,N.Y. B11 ....4.10
Pittsburg,Calif. C11 ....4.75
Portsmouth,O. P12 ....4.30
Roebling,N.J. R5 ....4.20
So.Chicago,Ill. R2 ....4.10
SparrowsPoint,Md. B2 ....4.20
Sterling,Ill.(1) N15 ....4.10
Struthers,O. Y1 ....4.10
Torrance,Calif. C11 ....4.90
Worcester,Mass. A7 ....4.40

SHEET STEEL PILING
Ind.Harbor,Ind. I-2 ....4.45
Lackawanna,N.Y. B2 ....4.45
Munhall,Pa. U5 ....4.45
So.Chicago,Ill. U5 ....4.45

STRUCTURALS
Carbon Steel Stand., Shapes
AlabamaCity,Ala. R2 ....3.60
Aliquippa,Pa. J5 ....3.65
Bessemer,Ala. T2 ....3.65
Bethlehem,Pa. B2 ....3.70
Clairton,Pa. U5 ....3.65
Fairfield,Ala. T2 ....3.65
Fontana,Calif. K1 ....4.25
Gary,Ind. U5 ....3.65
Geneva,Utah G1 ....3.65
Houston,Tex. S5 ....4.05
Ind.Harbor,Ind. I-2 ....3.65
Johnstown,Pa. B2 ....3.70
KansasCity,Mo. S5 ....4.25
Lackawanna,N.Y. B2 ....3.70
LosAngeles B3 ....4.25
Minnequa,Colo. C10 ....4.10
Munhall,Pa. U5 ....3.65
Niles,Calif.(22) P1 ....4.85
Phoenixville,Pa. P4 ....5.90
Portland,Oreg. O4 ....4.50
Seattle B3 ....4.30
So.Chicago,Ill. U5, W14 ....3.65
So.SanFrancisco B3 ....4.20
Torrance,Calif. C11 ....4.25
Weirton,W.Va. W6 ....3.90

Alloy Stand. Shapes
Clairton,Pa. U5 ....4.35
Fontana,Calif. K1 ....5.55
Munhall,Pa. U5 ....4.35
So.Chicago,Ill. U5 ....4.35

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 ....5.50
Bessemer,Ala. T2 ....5.50
Bethlehem,Pa.(14) B2 ....5.50
Clairton,Pa. U5 ....5.50
Fairfield,Ala. T2 ....5.50
Fontana,Calif. K1 ....6.10
Gary,Ind. U5 ....5.50
Geneva,Utah G1 ....5.50
Ind.Harbor,Ind. I-2 ....5.50
Ind.Harbor,Ind. Y-1 ....6.00
Johnstown,Pa. B2 ....5.50
Lackawanna,N.Y.(14)B2 ....5.50
LosAngeles B3 ....6.05
Munhall,Pa. U5 ....5.50
Seattle B3 ....6.10
So.Chicago,Ill. U5 ....5.50
So.SanFrancisco B3 ....6.00
Struthers,O. Y1 ....6.00

Wide Flange
Bethlehem,Pa. B2 ....3.70
Clairton,Pa. U5 ....3.65
Fontana,Calif. K1 ....4.65
Lackawanna,N.Y. B2 ....3.70
Munhall,Pa. U5 ....3.65
So.Chicago,Ill. U5 ....3.65

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 ....5.50
Lackawanna,N.Y. B2 ....5.50
Munhall,Pa. U5 ....5.45
So.Chicago,Ill. U5 ....5.45

BEARING PILES
Munhall,Pa. U5 ....3.65
So.Chicago,Ill. U5 ....3.65

PLATES, High-Strength Low-Alloy
Aliquippa,Pa. J5 ....5.65
Bessemer,Ala. T2 ....5.65
Clairton,Pa. U5 ....5.65
Cleveland J5, R2 ....5.65
Conshohocken,Pa. A3 ....5.90
Fairfield,Ala. T2 ....5.65
Fontana,Calif.(30) K1 ....6.25
Gary,Ind. U5 ....5.65
Geneva,Utah G1 ....5.65
Ind.Harbor,Ind. I-2 ....5.65
Ind.Harbor,Ind. Y1 ....6.15
Johnstown,Pa. B2 ....5.65
Munhall,Pa. U5 ....5.65
Pittsburgh J5 ....5.65
Seattle B3 ....6.55
Sharon,Pa. S3 ....5.70
So.Chicago,Ill. U5 ....5.65
SparrowsPoint,Md. B2 ....5.65
Warren,O. R2 ....5.65
Youngstown Y1 ....6.15

PLATES, Open-Hearth Alloy
Claymont,Del. C22 ....4.85
Coatesville,Pa. L7 ....5.25
Conshohocken,Pa. A3 ....5.05
Fontana,Calif. K1 ....5.70
Gary,Ind. U5 ....4.75
Johnstown,Pa. B2 ....4.75
Munhall,Pa. U5 ....4.75
Sharon,Pa. S3 ....5.20
So.Chicago,Ill. U5 ....4.75
SparrowsPoint,Md. B2 ....4.75

FLOOR PLATES
Cleveland J5 ....4.75
Conshohocken,Pa. A3 ....4.75
Ind.Harbor,Ind. I-2 ....4.75
Munhall,Pa. U5 ....4.75
So.Chicago,Ill., U5 ....4.75

PLATES, Ingot Iron
Ashland,c.(15) A10 ....3.95
Ashland,lel(15) A10 ....4.45
Cleveland,c.l. R2 ....4.30
Warren,O.c.l. R2 ....4.30

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ....3.70
Aliquippa,Pa. J5 ....3.70
Ashland,Ky.(15) A10 ....3.70
Bessemer,Ala. T2 ....3.70
Clairton,Pa. U5 ....3.70
Claymont,Del. C22 ....4.15
Cleveland J5, R2 ....3.70
Coatesville,Pa. L7 ....4.15
Conshohocken,Pa. A3 ....4.15
Fairfield,Ala. T2 ....3.70
Fontana,Calif. (30) K1 ....4.30
Gary,Ind. U5 ....3.70
GraniteCity,Ill. G4 ....4.40
Geneva,Utah G1 ....3.70
Harrisburg,Pa. C5 ....6.30
Houston,Tex. S5 ....4.10
Ind.Harbor,Ind. I-2, Y1..3.70
Johnstown,Pa. B2 ....3.70
Lackawanna,N.Y. B2 ....3.70
Minnequa,Colo. C10 ....3.85
Munhall,Pa. U5 ....3.70
Pittsburgh J5 ....3.70
Seattle B3 ....4.60
Sharon,Pa. S3 ....3.95
So.Chicago,Ill. U5, W14..3.70
SparrowsPoint,Md. B2 ....3.70
Steubenville,O. W10 ....3.70
Warren,O. R2 ....3.70
Weirton,W.Va. W6 ....4.00
Youngstown R2, U5, Y1..3.70

PLATES, Carbon A.R.
Fontana,Calif. K1 ....5.45
Geneva,Utah G1 ....4.85

PLATES, Wrought Iron
Economy,Pa. B14 ....8.60

BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 ....3.70
Aliquippa,Pa. J5 ....3.70
Alton,Ill. L1 ....4.15
Atlanta,Ga. A11 ....4.25
Bessemer,Ala. T2 ....3.70
Buffalo R2 ....3.70
Canton,O. R2 ....3.70
Clairton,Pa. U5 ....3.70
Cleveland R2 ....3.70
Detroit R7 ....3.85
Emeryville,Calif. J7 ....4.45
Fairfield,Ala. T2 ....3.70
Fontana,Calif. K1 ....4.40
Gary,Ind. U5 ....3.70
Houston,Tex. S5 ....4.10
Ind.Harbor,Ind. I-2, Y1..3.70
Johnstown,Pa. B2 ....3.70
Kansas City,Mo. S5 ....4.30
Lackawanna,N.Y. B2 ....3.70
LosAngeles B3 ....4.40
Milton,Pa. B6 ....4.20
Minnequa,Colo. C10 ....4.15
Niles,Calif. P1 ....5.05
N.Tonawanda,N.Y. B11 ....3.70
Pittsburg,Calif. C11 ....4.40
Pittsburgh J5 ....3.70
Portland,Oreg. O4 ....4.65
Seattle B3, N14 ....4.45
Struthers,O. Y1 ....3.70
Torrance,Calif. C11 ....4.40
Weirton,W.Va. W6 ....3.85
So.Chicago R2, U5, W14..3.70
So.Duquesne,Pa. U5 ....3.70
So.SanFran.,Cal. B3 ....4.45
Youngstown R2, U5 ....3.70

BAR SIZE ANGLES; S. SHAPES
Aliquippa,Pa. J5 ....3.70
Atlanta A11 ....4.25
Johnstown,Pa. B2 ....3.70
Lackawanna,N.Y. B2 ....3.70
Niles,Calif. P1 ....5.05
Portland,Oreg. O4 ....4.65
SanFrancisco S7 ....4.85

BAR SIZE ANGLES; H.R. CARBON
Bethlehem,Pa. B2 ....3.90

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 ....4.30
Buffalo R2 ....4.30
Canton,O. R2 ....4.30
Canton,O.(29) T7 ....3.95
Clairton,Pa. U5 ....4.30
Detroit R7 ....4.45
Ecorse,Mich. G5 ....4.85
Fontana,Calif. K1 ....5.35
Gary,Ind. U5 ....4.30
Houston,Tex. S5 ....4.70
Ind.Harbor,Ind. I-2, Y1..4.30
Johnstown,Pa. B2 ....4.30
KansasCity,Mo. S5 ....4.90
Lackawanna,N.Y. B2 ....4.30
LosAngeles B3 ....5.35
Massillon,O. R2 ....4.30
Midland,Pa. C18 ....4.30
So.Chicago R2, U5, W14..4.30
So.Duquesne,Pa. U5 ....4.30
Struthers,O. Y1 ....4.30
Warren,O. C17 ....4.30
Youngstown U5 ....4.30

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 ....4.55
Gary,Ind. U5 ....4.55
Youngstown U5 ....4.55

BARS & SMALL SHAPES, H.R., High-Strength Low-Alloy
Aliquippa,Pa. J5 ....5.55
Bessemer,Ala. T2 ....5.55
Bethlehem,Pa. B2 ....5.55
Clairton,Pa. U5 ....5.55
Cleveland R2 ....5.55
Fairfield,Ala. T2 ....5.55
Fontana,Calif. K1 ....6.60
Gary,Ind. U5 ....5.55
Ind.Harbor,Ind. I-2 ....5.55
IndianaHarbor,Ind. Y1 ....6.05
Johnstown,Pa. B2 ....5.55
Lackawanna,N.Y. B2 ....5.55
LosAngeles B3 ....6.25
Pittsburgh J5 ....5.55
Seattle B3 ....6.30
So.Duquesne,Pa. U5 ....5.55
So.SanFrancisco B3 ....6.30
Struthers,O. Y1 ....6.05
Youngstown U5 ....5.55

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ....4.55
BeaverFalls,Pa. M12, R2..4.55
Buffalo B3 ....4.60
Camden,N.J. P13 ....5.00
Carnegie,Pa. C12 ....4.55
Chicago W18 ....4.55
Cleveland A7, C20 ....4.55
Detroit P17 ....4.70
Donora,Pa. A 7 ....4.55
Elyria,O. W8 ....4.55
FranklinPark,Ill. N5 ....4.55
Gary,Ind. R2 ....4.55
GreenBay,Wis. F7 ....4.55
Hammond,Ind. L2, M13 ....4.55
Hartford,Conn. R2 ....5.10
Harvey,Ill. B5 ....4.55
LosAngeles R2 ....6.00
Mansfield,Mass. B5 ....5.10
Massillon,O. R2, R8 ....4.55
Monaca,Pa. S17 ....4.55
Newark,N.J. W18 ....5.00
Plymouth,Mich. P5 ....4.80
Pittsburgh J5 ....4.55
Putnam,Conn. W18 ....5.10
Readville,Mass. C14 ....5.10
St.Louis,Mo. M3 ....4.95
So.Chicago,Ill. W14 ....4.55
SpringCity,Pa. (5) K3 ....5.00
Struthers,O. Y1 ....4.55
Waukegan,Ill. A7 ....4.55
Youngstown F3, Y1 ....4.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ....5.40
BeaverFalls,Pa. M12 ....5.40
Bethlehem,Pa. B2 ....5.40
Buffalo B5 ....5.40
Camden,N.J. P13 ....5.80
Canton,O. R2 ....5.40
Canton,O.(29) T7 ....4.90
Carnegie,Pa. C12 ....5.40
Chicago W18 ....5.40
Cleveland A7 ....5.45
Cleveland C20 ....5.40
Detroit P17 ....5.55
Donora,Pa. A7 ....5.45
Elyria,O. W8 ....5.40
Gary,Ind. R2 ....5.40
Hammond,Ind. L2, M13 ....5.40
Hartford,Conn. R2 ....5.85
Harvey,Ill. B5 ....5.40
Lackawanna,N.Y. B2 ....5.40
Mansfield,Mass. B5 ....5.85
Massillon,O. R2, R8 ....5.40
Midland,Pa. C18 ....5.40
Monaca,Pa. S17 ....5.40
Newark,N.J. W18 ....5.75
Plymouth,Mich. P5 ....5.60
So.Chicago,Ill. R2, W14 ....5.40
Struthers,O. Y1 ....5.40
Warren,O. C17 ....5.40
Waukegan,Ill. A7 ....5.45
Worcester,Mass. A7 ....5.75
Youngstown F3, Y1 ....5.40

RAIL STEEL BARS
ChicagoHts.(3,4) C2 ....4.75
ChicagoHts.(3,4) I-2 ....4.75
Franklin,Pa. (3,4) F3 ....4.75
FortWorth,Tex.(26) T4 ....4.85
Huntngtn,W.Va.(3) W7 ....5.50
Marion,O.(3) P11 ....4.75
Moline,Ill.(3) R2 ....3.80
Tonawanda (3,4) B12 ....4.75
Williamsport(3) S19 ....5.00
Williamsport(4) S19 ....5.10

BARS, Wrought Iron
Dover,N.J.(Staybolt)U1 15.00
Dover,(Eng.Bolt) U1 ....13.50
Dover,(Wrgh.Iron) U1 ....12.25
Economy,Pa. (S.R.) B14 ....9.60
Economy,Pa.(D.R.)B14 ....11.90
Economy,(Staybolt)B14 ....12.20
McK.Rks.(Staybolt) L5 ....14.50
McK.Rks.(S.R.) L5 ....9.60
McK.Rks.(D.R.) L5 ....13.00

BARS, Reinforcing (Fabricated)
AlabamaCity,Ala. R2 ....3.70
Atlanta A11 ....4.25
Buffalo R2 ....3.70
Cleveland R2 ....3.70
Emeryville,Calif. J7 ....4.45
Fairfield,Ala. T2 ....3.70
Fontana,Calif. K1 ....4.40
Gary,Ind. U5 ....3.70
Houston,Tex. S5 ....4.10
Ind.Harbor,Ind. I-2, Y1..3.70
Johnstown,Pa. B2 ....3.70
KansasCity,Mo. S5 ....4.30
Lackawanna,N.Y. B2 ....3.70
LosAngeles B3 ....4.40
Milton,Pa. B6 ....4.20
Niles,Calif. P1 ....5.05
Pittsburgh J5 ....3.70
Seattle B3 ....4.45
So.Chicago R2, U5 ....3.70
SparrowsPoint,Md. B2 ....3.70
Steubenville,O. W10 ....3.70
Torrance,Calif. C11 ....4.30
Warren,O. R2 ....3.70
Weirton,W.Va. W6 ....3.70
Youngstown U5, Y1 ....3.70

BARS, Reinforcing
(Fabricated; to Consumers)
Huntington,W.Va. W7 ....5.50
Johnstown, ¼-1" B2 ....4.75
LosAngeles B3 ....5.45
Marion,O. P11 ....5.00
Seattle B3, N14 ....5.55
So.SanFrancisco B3 ....5.45
SparrowsPt. ¼-1" B2 ....4.75
Williamsport,Pa. S19 ....5.10

SHEETS, Hot-Rolled Steel
(18 gage and heavier)
AlabamaCity,Ala. R2 ....3.60
Ashland,Ky.(8) A10 ....3.60
Butler,Pa. A10 ....3.60
Cleveland J5, R2 ....3.60
Conshohocken,Pa. A3 ....4.00
Detroit M1 ....4.40
Ecorse,Mich.(8) G5 ....3.80
Fairfield,Ala. T2 ....3.60
Fontana,Calif. K1 ....4.55
Gary,Ind. U5 ....3.60
Geneva,Utah G1 ....3.70
GraniteCity,Ill. G4 ....4.30
Ind.Harbor,Ind. I-2, Y1..3.60
Irvin,Pa. U5 ....3.60
Lackawanna,N.Y. B2 ....3.60
Munhall,Pa. U5 ....3.60
Niles,O. N12 ....5.25
Pittsburg,Calif. C11 ....4.30
Pittsburgh J5 ....3.60
Sharon,Pa. S3 ....4.00
So.Chicago,Ill. W14 ....3.60
SparrowsPoint,Md. B2 ....3.60
Steubenville,O. W10 ....3.60
Torrance,Calif. C11 ....4.30
Warren,O. R2 ....3.60
Weirton,W.Va. W6 ....3.60
WestLeechburg,Pa. A4 ....3.75
Youngstown U5, Y1 ....3.60

SHEETS, H.R., (19 gage)
AlabamaCity,Ala. R2 ....4.75
Dover,O. R1 ....5.65
Ind.Harbor,Ind. I-2 ....5.40
Mansfield,O. E6 ....5.65
Niles,O. N12 ....4.75
Torrance,Calif. C11 ....5.40

SHEETS, H.R., (14-ga., heavier) High-Strength Low-Alloy
Cleveland J5, R2 ....5.40
Conshohocken,Pa. A3 ....5.65
Ecorse,Mich. G5 ....5.95
Fairfield,Ala. T2 ....5.40
Fontana,Calif. K1 ....6.35
Gary,Ind. U5 ....5.40
Ind.Harbor,Ind. I-2 ....5.40
IndianaHarbor,Ind. Y1..5.90
Irvin,Pa. U5 ....5.40
Lackawanna(35) B2 ....5.40
Pittsburgh J5 ....5.40
Sharon,Pa. S3 ....5.40
So.Chicago,Ill. U5 ....5.40
SparrowsPoint (36) B2 ....5.40
Warren,O. R2 ....5.40
Weirton,W.Va. W6 ....5.75
Youngstown U5 ....5.40
Youngstown Y1 ....5.90

SHEETS, Cold-Rolled High-Strength Low-Alloy
Cleveland J5, R2 ....6.55
Ecorse,Mich. G5 ....7.10
Fontana,Calif. K1 ....7.50
Gary,Ind. U5 ....6.55
Indiana Harbor,Ind. Y1..7.05
IndianaHarbor,Ind. I-2 ....6.55
Irvin,Pa. U5 ....6.55
Lackawanna(37) B2 ....6.55
Pittsburgh J5 ....6.55
SparrowsPoint(38) B2 ....6.55
Warren,O. R2 ....6.55
Weirton,W.Va. W6 ....6.90
Youngstown Y1 ....7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10	4.35
Cleveland J5, R2	4.35
Ecorse,Mich. G5	4.35
Fairfield,Ala. T2	4.35
Follansbee,W.Va. F4	5.35
Fontana,Calif. K1	5.30
Gary,Ind. U5	4.35
GraniteCity,Ill. G4	5.05
Ind.Harbor,Ind. I-2, Y1	4.35
Irvin,Pa. U5	4.35
Lackawanna,N.Y. B2	4.35
Middletown,O. A10	4.35
Pittsburg,Calif. C11	5.30
Pittsburgh J5	4.35
SparrowsPoint,Md. B2	4.35
Steubenville,O. W10	4.35
Warren,O. R2	4.35
Weirton,W.Va. W6	4.35
Youngstown Y1	4.35

SHEETS, Galv'd No. 10 Steel

AlabamaCity,Ala. R2	4.80
Ashland,Ky.(8) A10	4.80
Canton,O. R2	4.80
Dover,O. R1	5.50
Fairfield,Ala. T2	4.80
Gary,Ind. U5	4.80
GraniteCity,Ill. G4	5.50
Ind.Harbor,Ind. I-2	4.80
Irvin,Pa. U5	4.80
Kokomo,Ind.(13) C16	5.20
MartinsFerry,O. W10	4.80
Niles,O. N12	6.00
Pittsburg,Calif. C11	5.55
SparrowsPoint,Md. B2	4.80
Steubenville,O. W10	4.80
Torrance,Calif. C11	5.55
Weirton,W.Va. W6	4.80

SHEETS, Galvanized No. 10, High-Strength Low-Alloy

Irvin,Pa. U5	7.20
SparrowsPoint(29) B2	6.75

SHEETS, Galvannealed Steel

Canton,O. R2	5.35
Irvin,Pa. U5	5.35
Kokomo,Ind.(13) C16	5.75
Niles,O. N12	6.55

SHEETS, ZINCGRIP Steel No. 10

Butler,Pa. A10	5.05
Middletown,O. A10	5.05

SHEETS, Electro Galvanized

Cleveland R2 (28)	5.65
Niles,O. R2 (28)	5.65
Weirton,W.Va. W6	5.50

SHEETS, Zinc Alloy

Ind.Harbor,Ind. I-2	5.70

SHEETS, Drum Body

Pittsburg,Calif. C11	4.30
Torrance,Calif. C11	4.30

SHEETS, Well Casing

Fontana,Calif. K1	5.10
Torrance,Calif. C11	5.10

BLUED Stock, 29 ga.

Yorkville,O. W10	6.80
Follansbee,W.Va.(23) F4	6.85

TIN PLATE, Electrolytic (Base Box)

	0.25-lb	0.50 lb	0.75lb
Aliquippa,Pa. J5	$7.15	$7.40	$7.80
Fairfield,Ala. T2	7.25	7.50	7.90
Gary,Ind. U5	7.15	7.40	7.80
GraniteCity,Ill. G4	7.35	7.60	8.00
Ind.Harbor,Ind. I-2, Y1	7.15	7.40	7.80
Irvin,Pa. U5	7.15	7.40	7.80
Niles,O. R2	7.15	7.40	7.80
Pittsburg,Calif. C11	7.90	8.15	8.55
SparrowsPoint,Md. B2	7.25	7.50	7.90
Weirton,W.Va. W6	7.15	7.40	7.80
Yorkville,O. W10	7.15	7.40	7.80

SHEETS, SILICON, H.R. or C.R.(22 Ga.) COILS (Cut Lengths ½c lower)

	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W10 (cut-lengths)	...	...	7.25	8.50	9.30
Brackenridge,Pa. A4	...	...	7.75	9.00	9.80
GraniteCity,Ill.G4 (cut lengths)	...	...	7.95	9.20	...
Ind.Harbor,Ind. I-2	6.95	7.25	(34)	...	...
Mansfield,O. E6 (cut lengths)	7.10	7.25	7.75	9.00	9.80
Niles,O. N12 (cut lengths)	...	6.75	7.25	...	...
Vandergrift,Pa. U5	...	7.25	7.75	9.00	9.80
Warren,O. R2	6.95	7.25	7.75	9.00	9.80
Zanesville,O. A10	...	7.25	7.75	9.00	9.80

SHEETS, SILICON (22 Ga. Base) Coils (Cut Lengths ½c lower)

Transformer Grade	72	65	58	52
BeechBottom W10 (cut lengths)	9.85	10.40	11.10	11.90
Brackenridge,Pa. A4	10.35	...	...	...
Vandergrift,Pa. U5	10.35	10.90	11.60	12.40
Warren,O. R2	10.35	...	...	...
Zanesville,O. A10	10.35	10.90	11.60	12.40

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)

	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)	...	...	14.75	15.25
Vandergrift,Pa. U5	12.90	13.75	14.75	15.25

SHEETS, Enameling Iron

Ashland,Ky.(8) A10	4.65
Cleveland R2	4.65
Gary,Ind. U5	4.65
GraniteCity,Ill. G4	5.35
Ind.Harbor,Ind. I-2	4.65
Irvin,Pa. U5	4.65
Middletown,O. A10	4.65
Youngstown Y1	4.65

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$6.25
Fairfield,Ala. T2	6.35
Gary,Ind. U5	6.25
GraniteCity,Ill. G4	6.45
Ind.Harbor,Ind. I-2, Y1	6.25
Irvin,Pa. U5	6.25
Niles,O. R2	6.25
Pittsburg,Calif. C11	7.00
SparrowsPoint,Md. B2	6.35
Warren,O. R2	6.25
Weirton,W.Va. W6	6.25
Yorkville,O. W10	6.25

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee,W.Va. F4	5.85
Gary,Ind. U5	5.85
GraniteCity,Ill. G4	6.05
Ind.Harbor,Ind. Y1	5.30
Irvin,Pa. U5	5.85
Yorkville,O. W10	6.15

SHEETS, Culvert No. 16

	Cu Alloy	Cu Fe
Ashland,Ky. A10	5.60	...
Canton,O. R2	5.65	6.10
Fairfield,Ala. T2	5.60	5.85
Gary,Ind. U5	5.60	5.85
IndianaHarbor I-2	5.60	5.85
Irvin,Pa. U5	5.60	5.85
Kokomo,Ind. C16	6.25	...
MartinsFy,O. W10	5.60	5.85
Pittsburg,Cal. C11	6.35	...
SparrowsPt, B2	5.60	...
Torrance,Cal. C11	6.35	...

SHEETS, Cuvert, No. 16 Pure Iron

Ashland,Ky. A10	5.85
Fairfield,Ala. T2	5.85

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland,Ky.(8) A10	3.85
Cleveland R2	4.20
Ind.Harbor,Ind. I-2	3.85
Warren,O. R2	4.20

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2	4.95
Middletown,O. A10	4.85
Warren,O. R2	4.95

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10	5.05
Canton,O. R2	5.55

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	5.30
Middletown,O. A10	5.30

SHEETS, ALUMINIZED

Butler,Pa. A10	8.15

TINPLATE, American Coke (Base Box)

	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$8.45	$8.70
Fairfield,Ala. T2	8.55	8.80
Gary,Ind. U5	8.45	8.70
Ind.Har.-I-2, Y1	8.45	8.70
Irvin,Pa. U5	8.45	8.70
Pitts,Cal. C11	9.20	9.45
Sp.Pt.,Md. B2	8.55	8.80
Warren,O. R2	8.45	8.70
Weirton,W.Va. W6	8.45	8.70
Yorkville,O. W10	8.45	8.70

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$7.60
Gary,Ind. U5	7.50
Irvin,Pa. U5	7.50
SparrowsPoint,Md. B2	7.60
Yorkville,O. W10	7.50

SHEETS, LT. Coated Ternes, 6 lb

Yorkville,O. W10	$8.40

SHEETS, Mfg. Ternes, 8 lb (Commercial Quality)

Gary,Ind. U5	$9.50
Yorkville,O. W10	9.50

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va.W10	5.20
Gary,Ind. U5	5.20
Mansfield,O. E6	6.05
Middletown,O. A10	5.20
Niles,O. N12	6.00
Weirton,W.Va. W6	5.20

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.60

ROOFING SHORT TERNES (8 lb Coated)

Gary,Ind. U5	9.50

STRIP, Hot-Rolled High-Strength Low Alloy

Bessemer,Ala. T2	5.30
Conshohocken,Pa. A3	5.55
Ecorse,Mich. G5	5.95
Fairfield,Ala. T2	5.30
Fontana,Calif. K1	6.20
Gary,Ind. U5	5.30
Ind.Harb.,Ind. I-2	5.30
IndianaHarbor,Ind. Y1	5.80
Lackawanna,N.Y. B2	4.95
LosAngeles(25) B3	6.05
Seattle B3	6.30
Sharon,Pa. S3	5.40
So.SanFrancisco(25) B3	6.05
SparrowsPoint,Md. B2	4.95
Warren,O. R2	5.30
Weirton,W.Va. W6	5.75
Youngstown Y1	5.80
Youngstown U5	5.30

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland J5	6.70
Cleveland A7	6.55
Dover,O. G6	7.30
Fontana,Calif. K1	6.95
Lackawanna,N.Y. B2	6.40
Sharon,Pa. S3	6.55
SparrowsPoint,Md. B2	6.40
Warren,O. R2	6.55
Weirton,W.Va. W6	7.20
Youngstown Y1	7.05

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	3.50
Alton,Ill. L1	3.95
Ashland,Ky.(8) A10	3.50
Atlanta A11	4.05
Bessemer,Ala. T2	3.50
Bridgeprt,Conn.(10) S15	4.00
Buffalo(27) R2	3.50
Butler,Pa. A10	3.50
Carnegie,Pa.-S18	4.00
Conshohocken,Pa. A3	3.90
Detroit M1	4.40
Ecorse,Mich. G5	3.50
Fairfield,Ala. T2	3.50
Fontana,Calif. K1	4.75
Gary,Ind. U5	3.50
Houston,Tex. S5	4.90
Ind.Harbor,Ind. I-2, Y1	3.50
Johnstown,Pa.(25) B2	3.50
KansasCity,Mo.(9) S5	4.10
Lackawanna,N.Y.(32) B2	3.50
LosAngeles B3	4.25
Milton,Pa. B6	4.00
Minnequa,Colo. C10	4.55
NewBritain(10) S15	4.00
No.Tonawanda,N.Y. B11	3.50
Pittsburg,Calif. C11	4.25
Riverdale,Ill. A1	3.50
SanFrancisco S7	4.85
Seattle B3, N14	4.50
Sharon,Pa. S3	4.00
So.Chicago,Ill. W14	3.50
So.SanFrancisco B3	4.25
SparrowsPoint,Md. B2	3.50
Torrance,Calif. C11	4.25
Warren,O. R2	3.50
Weirton,W.Va. W6	3.60
WestLeechburg,Pa. A4	3.75
Youngstown U5, Y1	3.50

STRIP, Hot-Rolled Alloy

Bridgeprt,Conn.(10) S15	5.45
Carnegie,Pa. S18	5.85
Fontana,Calif. K1	6.70
Gary,Ind. U5	5.50
Houston,Tex. S5	5.90
KansasCity,Mo. S5	6.10

STRIP, Cold-Finished, Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Berea,O. C7	...	6.80	7.40	9.35	11.65
Bridgeport,Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
Bristol,Conn. W1	...	...	7.70	9.65	...
Carnegie,Pa. S18	...	6.80	7.40	9.35	11.65
Cleveland A7	4.65	6.45	7.40	9.35	11.65
Dearborn,Mich. D3	5.60	7.05	7.65	...	...
Detroit D2	5.60	6.65	7.25	...	...
Dover,O. G6	5.50	6.80	7.40	9.35	11.65
FranklinPark,Ill. T6	5.00	6.90	7.55	9.50	11.80
Harrison,N.J. C18	...	...	7.70	9.65	11.95
Mattapan,Mass. T6	5.50	6.75	7.70	9.65	11.95
NewBritn.,Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
NewCastle,Pa. B4	5.35	6.80	7.40	9.35	...
NewCastle,Pa. E5	5.50	6.80	7.40	9.35	11.65
NewHaven,Conn. D2	5.85	6.75	7.35	...	...
NewYork W3	...	...	7.10	7.70	9.65	11.95
Pawtucket,R.I. NS: Cleve.orPitts.Base	...	6.80	7.40	9.35	11.65
Worcester,Mass.,Base	5.85	7.10	7.70	9.65	11.95
Sharon,Pa. S3	5.35	6.80	7.40	9.35	11.65
Trenton,N.J. R5	...	7.10	7.70	9.65	11.95
Wallingford,Conn. W2	5.85	6.75	7.35	9.30	11.60
Weirton,W.Va. W6	5.35	6.80	7.40	9.35	11.65
Worcester,Mass. A7	4.95	6.75	7.70	9.65	11.95
Worcester,Mass. T6	5.50	6.75	7.70	9.65	11.95
Youngstown CS	...	6.80	7.40	9.35	11.65

Spring Steel (Tempered)

Trenton,N.J. R5	...	...	10.30	12.50	15.35
Harrison,N.J. C18	...	...	10.30	12.50	15.35
NewYork W3	...	...	10.30	12.50	15.35

STRIP, Hot-Rolled Carbon

Midland,Pa. C18	5.85
NewBritn,Conn.(10) S15	5.45
Sharon,Pa. S3	5.85
Youngstown U5	5.50

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6	5.50
Berea,O. C7	6.60
Bridgeprt,Conn.(10) S15	5.35
Butler,Pa. A10	4.65
Cleveland A7, J5	4.65
Dearborn,Mich. D3	5.60
Detroit D2	5.60
Detroit M1	5.45
Dover,O.(40) G6	5.50
Ecorse,Mich. G5	4.85
Follansbee,W.Va. F4	5.35
Fontana,Calif. K1	6.30
FranklinPark,Ill.(40) T6	4.90
Ind.Harbor,Ind. I-2	4.90
Lackawanna,N.Y. B2	4.65
LosAngeles C1	6.40
Mattapan,Mass. T6	5.50
Middletown,O. A10	4.65
NewBritain(10) S15	5.35
NewCastle,Pa. B4	5.35
NewCastle,Pa.(40) E5	5.25
NewHaven,Conn. D2	5.85
NewHaven,Conn. A7	5.15
Pawtucket,R.I. R3	6.00
Pawtucket,R.I.(21) NS	5.85
Riverdale,Ill.(40) A1	4.90
Rome,N.Y. R6	5.10
Sharon,Pa. S3	5.35
SparrowsPoint,Md. B2	4.65
Trenton,N.J. R5	6.00
Wallingford,Conn. W2	5.85
Warren,O.(40) T5	5.25
Warren,O. R2	4.65
Weirton,W.Va. W6	4.65
Youngstown CS (40)	5.25
Youngstown Y1	4.65

STRIP, Electro Galvanized

Dover,O. G6	5.50
Warren,O. T5	5.25
Weirton,W.Va. W6	4.65
Youngstown CS	5.25

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.

B1 Babcock & Wilcox Tube
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Boardi Steel Corp.
B8 Braeburn Alloy Steel
B11 Buffalo Bolt Co.
B12 Buffalo Steel Co.
B14 A. M. Byers Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div. Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia Steel Co.
C12 Columbia Steel & Shaft
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Corp.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Steel
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div. Borg-Warner Corp.
F6 Fritz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
G1 Geneva Steel Co.
G2 Globe Iron Co.
G3 Globe Steel Tubes Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greef Steel Co.

H1 Hanna Furnace Corp.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div. Borg-Warner Corp.

J1 Jackson Iron & Steel Co
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Electric Steel
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

STRIP, Cold-Rolled Alloy Steel

Bridgeprt,Conn.(10)	S15 10.75
Carnegie,Pa. S18	....10.60
Cleveland A7	.....10.00
Dover, O. G6	.....10.50
Fontana,Calif. K1	...11.65
Harrison,N.J. C18	....10.60
Midland,Pa. ..C18	....10.60
NewBrtn,Conn.(10)	S15 10.75
Pawtucket,R.I.(11)	NS.10.75
Pawtucket,R.I.(12)	NS.11.05
Sharon,Pa. S3	.....10.60
Worcester,Mass. A7	..10.30
Youngstown C8	.....10.60

STRIP, Hot-Rolled Ingot Iron

Asland,Ky. (8)	A10 ..3.75
Warren,O. R2	.....4.10

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	.....5.25

TIGHT COOPERAGE HOOP

Atlanta A11	.....4.05
Riverdale,Ill. A1	.....3.90
Sharon,Pa. S3	.....4.15
Youngstown U5	.....3.75

WIRE, Merchant Quality

(6 to 8 gage)	An'ld	Galv.
AlabamaCity R2	5.70	5.95
Aliquippa J5	5.70	6.15
Atlanta A11	5.95	6.40
Bartonville(19) K4	5.70	6.15
Buffalo W12	4.85	...
Cleveland A7	5.70	6.15
Crawfordsville MS	5.95	6.40
Donora,Pa. A7	5.70	6.15
Duluth,Minn. A7	5.70	6.15
Fairfield T2	5.70	6.15
Houston,Tex. S5	6.10	6.55
Johnstown B2	5.70	6.15
Joliet,Ill. A7	5.70	6.15
KansasCy,Mo. S5	6.30	6.75
Kokomo C16	5.80	6.05
LosAngeles B3	6.65	...
Minnequa C10	5.95	6.45
Monessen P7	5.95	6.40
Palmer W12	5.15	...
Pitts.,Calif. C11	6.65	6.80
Prtsmth.(18) P12	6.10	6.60
Rankin A7	5.70	6.15
So.Chicago R2	5.70	5.95
So.S.Fran. C10	6.65	7.10
SparrowsPt. B2	5.80	6.25
Sterling,Ill.(1) N15	5.70	6.15
Struthers,O. Y1	5.70	6.15
Torrance,Cal. C11	6.65	...
Worcester A7	6.00	6.45

ROPE WIRE

	(A)	(B)
Alton,Ill. L1	8.65	8.90
Bartonville,Ill. K4	8.55	8.80
Buffalo W12	8.55	8.80
Fostoria,O. S1	8.85	9.10
Johnstown,Pa. B2	8.55	8.80
Monessen,Pa. P16	8.55	8.80
Monessen,Pa. P7	8.80	9.05
Palmer,Mass. W12	8.85	9.10
Portsmouth,O. P12	8.55	8.80
Roebling,N.J. R5	8.85	9.10
SparrowsPt. B2	8.65	8.90
Struthers,O. Y1	8.55	8.80
Worcester J4, T6	8.85	9.10

(A) Plow and Mild Plow.
(B) Improved Plow.

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	...4.85
Aliquippa,Pa. J5	.....4.85
Atlanta A11	.....5.10
Alton,Ill. L1	.....5.05
Bartonville,Ill.(1) K4	...4.85
Buffalo W12	.....4.85
Chicago W13	.....5.10
Cleveland A7, C20	....4.85
Crawfordsville,Ind. MS	.5.10
Donora,Pa. A7	.....4.85
Duluth,Minn. A7	.....4.85
Fairfield,Ala. T2	....4.85
Fostoria,O.(24) S1	....5.35
Houston S5	.....5.25
Johnstown,Pa. B2	.....4.85
Joliet,Ill. A7	.....4.85
KansasCity,Mo. S5	....5.45
Kokomo,Ind. C16	.....4.95
LosAngeles B3	.....5.80
Minnequa,Colo. C10	....5.10
Monessen,Pa. P7	.....5.10
Newark, 6-8 ga. I-1	....5.50
No.Tonawanda B11	....4.85
Palmer,Mass. W12	....5.15
Pittsburg,Calif. C11	....5.80
Portsmouth,O. P12	....5.25
Rankin,Pa. A7	.....4.85
So.Chicago,Ill. R2	....4.85
So.SanFrancisco C10	...5.80
SparrowsPoint,Md. B2	..4.95
Sterling,Ill.(1) N15	....4.85
Struthers,O. Y1	.....4.85
Torrance,Calif. C11	....5.80
Waukegan,Ill. A7	.....4.85
Worcester,Mass. A7, T6	.5.15

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	.....6.20
Buffalo W12	.....6.35
Cleveland A7	.....5.85
Crawfordsville,Ind. MS	..6.20
Detroit D2	.....6.20
Dover,O. G6	.....6.20
Fostoria,O. S1	.....6.00
Kokomo,Ind. C16	.....5.70
FranklinPark,Ill. T6	...6.20
Massillon,O. R8	.....5.85
Monessen,Pa. P16	.....5.85
Monessen,Pa. P7	.....6.10
NewHaven,Conn. D2	....6.50
Pawtucket,R.I.(12) NS	..6.85
Trenton,N.J. R5	.....6.15
Worcester,Mass. A7	....6.15
Worcester,Mass. T6	....6.50
Worcester,Mass. W12	....6.65

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4	.....8.50
Monessen,Pa. P16	.....8.50
Roebling,N.J. R5	.....8.80
SparrowsPoint,Md. B2	..8.60
Johnstown,Pa. B2	.....8.50

WIRE, Tire Bead

Bartonville,Ill.(1) K4	..10.90
Monessen,Pa. P16	....11.40
Roebling,N.J. R5	.....11.55

WIRE (16 gage)	An'ld Galv.	Stone Galv.
Aliquippa J5	10.15	12.15
Bartonville(1) K4	10.25	11.95
Cleveland A7	10.25	12.15
Crawfrdsville MS	10.30	12.00
Fostoria,O. S1	10.40	13.00
Johnstown B2	10.25	12.15
Kokomo C16	10.25	11.95
Minnequa C10	10.40	12.40
Palmer,Mass. W12	10.25	12.15
Pitts.Cal. C11	10.60	12.50
Prtsmth.(18) P12	10.55	12.30
SparrowsPt. B2	10.35	12.25
Waukegan A7	10.25	12.15

WIRE, MB Spring High Carbon

Aliquippa,Pa. J5	.....6.25
Alton,Ill. L1	.....6.45
Bartonville,Ill.(1) K4	..6.25
Buffalo W12	.....6.25
Cleveland A7	.....6.25
Donora,Pa. A7	.....6.25
Duluth,Minn. A7	.....6.25
Fostoria,O. S1	.....6.25
Johnstown,Pa. B2	.....6.25
LosAngeles B3	.....7.20
Milbury,Mass.(12) N6	8.95
Monessen,Pa. P7, P16	6.25
Palmer,Mass. W12	.....6.55
Pittsburg,Calif. C11	....7.20
Roebling,N.J. R5	.....6.55
Portsmouth,O. P12	.....6.25
So.Chicago,Ill R2	.....6.25
So.SanFrancisco C10	....7.20
SparrowsPoint,Md. B2	..6.35
Struthers,O. Y1	.....6.25
Trenton,N.J. A7	.....6.55
Waukegan,Ill. A7	.....6.25
Worcester A7, T6, W12	.6.55
Worcester,Mass. J4	.....6.75

WIRE, Fine & Weaving(8" Coils)

Bartonville,Ill.(1) K4	..8.90
Buffalo W12	.....8.90
Chicago W13	.....8.90
Cleveland A7	.....8.90
Crawfordsville,Ind. MS	..8.95
Fostoria,O. S1	.....8.90
Johnstown,Pa. B2	.....8.90
Kokomo,Ind. C16	.....8.90
Monessen,Pa. P16	.....8.90
Palmer,Mass. W12	.....9.20
Portsmouth,O. P12	.....8.90
Roebling,N.J. R5	.....9.20
Waukegan,Ill. A7	.....8.90
Worcester,Mass. A7	T6 9.20

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	...137
Aliquippa,Pa. J5	141
Atlanta A11	144
Bartonville,Ill.(19) K4	..144
Crawfordsville,Ind. MS	..146
Donora,Pa. A7	141
Duluth,Minn. A7	141
Fairfield,Ala. T2	141
Houston,Tex. S5	149
Johnstown,Pa. B2	141
Joliet,Ill. A7	141
KansasCity,Mo. S5	153
Kokomo,Ind. C16	143
Minnequa,Colo. C10	147
Monessen,Pa. P7	146
Pittsburg,Calif. C11	161
Portsmouth,O.(18) P12	..148
Rankin,Pa. A7	141
So.Chicago,Ill. R2	137
So.SanFran.,Calif. C10	.161
SparrowsPoint,Md. B2	..143
Sterling,Ill.(1) N15	141

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	.123
Atlanta A11	126
Bartonville,Ill.(19) K4	.123
Crawfordsville,Ind. MS	.123
Donora,Pa. A7	123
Duluth,Minn. A7	123
Fairfield,Ala. T2	123
Joliet,Ill. A7	123
KansasCity,Mo. S5	135
Kokomo,Ind. C16	125
Minnequa C10	123
Pittsburg,Calif. C11	147
So. Chicago,Ill R2	123
So.SanFran.,Calif. C10	.147
SparrowsPoint,Md. B2	..125
Sterling,Ill.(1) N15	123

WIRE, Upholstery Spring

Aliquippa,Pa. J5	.....5.90
Alton,Ill. L1	.....6.10
Buffalo W12	.....5.90
Cleveland A7	.....5.90
Donora,Pa. A7	.....5.90
Duluth,Minn. A7	.....5.90
Johnstown,Pa. B2	.....5.90
LosAngeles B3	.....6.85
Monessen,Pa. P7, P16	.5.90
NewHaven,Conn. A7	..6.20
Palmer,Mass. W12	.....6.20
Pittsburg,Calif. C11	....6.85
Portsmouth,O. P12	.....5.90
Roebling,N.J. R5	.....6.20
So.Chicago,Ill. R2	.....5.90
So.SanFrancisco C10	....6.85
SparrowsPoint,Md. B2	..6.00
Torrance,Calif. C11	....6.85
Trenton,N.J. A7	.....6.20
Waukegan,Ill. A7	.....5.90
Worcester,Mass. A7	.....6.20

WOVEN FENCE, 9-15½ Ga. Col.

AlabamaCity,Ala. R2	..127
Ala.City,Ala.,17-18ga.R2	214
Aliquippa,Pa.9-14½ga.J5	131
Atlanta A11	134
Bartonville,Ill.(19) K4	..131
Crawfordsville,Ind. MS	..133
Donora,Pa. A7	131
Duluth,Minn. A7	131
Fairfield,Ala. T2	131
Houston,Tex. S5	139
Johnstown,Pa. B2	131
Johnstown,17ga.,6" B2	.205
Johnstown,17ga.,4" B2	.208
Joliet,Ill. A7	131
KansasCity,Mo. S5	143
Kokomo,Ind. C16	133
Minnequa,Colo. C10	139
Monessen,Pa. P7	136
Pittsburg,Calif. C11	154
Portsmouth,O.(18) P12	..138
Rankin,Pa. A7	131
So.Chicago,Ill. R2	127
Sterling,Ill.(1) N15	131

FENCE POSTS

ChicagoHts.,Ill. C2	140
Duluth,Minn. A7	125
Franklin,Pa. F5	140
Huntington,W.Va. W7	140
Johnstown,Pa. B2	140
Marion,O. P11	140
Minnequa,Colo. C10	130
Moline,Ill. R2	136
So.Chicago,Ill. R2	140
Tonawanda,N.Y. B12	140
Williamsport,Pa. S19	150

TRACK BOLTS (20) Treated

KansasCity,Mo. S5	.....9.85
Lebanon,Pa.(31) B2	.....9.85
Minnequa,Colo. C10	.....9.85
Pittsburgh O3, P14	.....9.85
Seattle B3	.....10.35

RAILS

	Std. No. 1	Std. No. 2	All No. 2	Tee Rails 60 lb Under
Bessemer,Pa. U5	3.60	3.50	3.55	4.00
Ensley,Ala. T2	3.60	3.50		4.00
Fairfield,Ala. T2	...	...	...	4.00
Gary,Ind. U5	3.60	3.50	3.55	5.00
Huntington,W.Va. W7	...	...	...	4.00
Ind.Harbor,Ind. I-2	3.60	3.50	3.55	5.00
Johnstown,Pa. B2	...	...	...(16)	4.00
Lackawanna,N.Y. B2	3.60	3.50		4.00
Minnequa,Colo. C10	3.60	3.50		4.50
Steelton,Pa. B2	3.60	3.50		...
Williamsport,Pa. S19	...	...		4.75

NAILS & STAPLES, Stock To dealers & mfgrs. (7) — **Col.**

AlabamaCity,Ala. R2	...118
Aliquippa,Pa.(13) J5	...118
Atlanta A11	121
Bartonville,Ill.(19) K4	..118
Chicago,Ill. W13	118
Cleveland A9	125
Crawfordsville,Ind. MS	.122
Donora,Pa. A7	118
Duluth,Minn. A7	118
Fairfield,Ala. T2	118
Galveston,Tex. D7	126
Houston,Tex. S5	126
Johnstown,Pa. B2	118
Joliet,Ill. A7	118
KansasCity,Mo. S5	130
Kokomo,Ind. C16	120
Minnequa,Colo. C10	123
Monessen,Pa. P7	124
Pittsburg,Calif. C11	137
Portsmouth,O. P12	124
Rankin,Pa. A7	118
So.Chicago,Ill. R2	118
SparrowsPoint,Md. B2	..120
Sterling,Ill.(1) N15	118
Torrance,Calif. C11	138
Worcester,Mass. A7	124

NAILS, Cut (100 lb keg) To dealers (33)

Conshohocken,Pa. A3	$7.35
Wheeling,W.Va. W10	...7.35

TIE PLATES

Fairfield,Ala. T2	.....4.50
Gary,Ind. U5	.....4.50
Ind.Harbor,Ind. I-2	...4.50
Lackawanna,N.Y. B2	...4.50
Minnequa,Colo. C10	...4.50
Pittsburg,Calif. C11	...4.65
Seattle B3	.....4.65
Steelton,Pa. B2	.....4.50
Torrance,Calif. C11	...4.65

JOINT BARS

Bessemer,Pa. U5	.....4.70
Fairfield,Ala. T2	.....4.70
Ind.Harbor,Ind. I-2	...4.70
Joliet,Ill. U5	.....4.70
Lackawanna,N.Y. B2	...4.70
Minnequa,Colo. C10	...4.70
Steelton,Pa. B2	.....4.70

STANDARD TRACK SPIKES

Ind.Harbor,Ind. I-2, Y1	6.15
KansasCity,Mo. S5	...6.40
Lebanon,Pa. B2	.....6.15
Minnequa,Colo. C10	...6.15
Pittsburgh J5	.....6.15
Seattle B3	.....6.65
So.Chicago,Ill. R2	...6.15
Struthers,O. Y1	.....6.15
Youngstown R2	.....6.15

AXLES

Ind.Harbor,Ind. S13	....5.60
Johnstown,Pa. B2	....5.60

TOOL STEEL

Grade	$ per lb
Regular Carbon	.....0.230
Extra Carbon	.....0.270
Special Carbon	.....0.325
Oil Hardening	.....0.350
5% Cr Hot Work	.....0.350
1½-Carbon-Cr	.....0.635

Grade by Anaylsis

W	Cr	V	Co	
18	4	1	....	1.505
18	4	2	5	1.650
20	25	4.25	1.6	12.25 3.535-3.675
19	4	2	7	2.460
18	25	4.25	1	4.75 2.125
18	4	2	9	2.445-2.45
13.5	4	3	....	1.6025

W	Cr	V	Mo	
6.4	4.5	1.9	5	0.96-0.965
6	4	3	6	1.190
1.5	4	1	8.5	0.810

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2, and V3.

Footnotes:

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) Philadelphia del.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier (9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.50c for 17 Ga. & heavier.
(14) Also wide flange beams.
(15) ⅛" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25c off for untreated.
(21) New Haven, Conn. base.
(22) Del. San Francisco Bay area.
(23) 28 Ga. 36" wide.
(24) Deduct 0.20c, finer than 15 Ga.
(25) Bar mill bands.
(26) Redrawing, mill lengths, to fabricators; to consumers, 5.00c.
(27) 6-in. and wider.
(28) Bonderized.
(29) Subject to 10% increase.
(30) Sheared: add 0.35c for universal mill.
(31) Not annealed.
(32) Rd. or square edge.
(33) To jobbers, deduct 20c.
(34) 7.25c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 15 gage & lighter: 60" & narrower.
(38) 14 gage & lighter: 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.

Key to Producers

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M9 Midvale Co.
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M14 McInnes Steel Co.
N2 National Supply Co.
N3 National Tube Co.
N5 Nelson Steel & Wire Co.
N6 NewEng-HighCarb. Wire
N8 Newman-Crosby Steel
N12 Niles Rolling Mill Co.
N14 Nrthwst.Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills
P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,Eaton Mfg.
S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss-Sheffield S.&I. Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
T2 Tenn. Coal, Iron & R.R.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.
U1 Ulster Iron Works
U4 Universal Cyclops Steel
U5 United States Steel Co.
V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.
W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
Y1 YoungstownSheet&Tube

PLATEMANSHIP

H-VW-M's unique combination of:

. . . the most modern and complete laboratory for testing and development

. . . ability to provide complete equipment and materials for every plating and polishing need

. . . the complete background of knowledge and experience in every aspect of plating and polishing.

PLATEMANSHIP PLUS PR & WES-X FOR UNEQUALED

...it gives smoother, brighter deposits

...it has exceptional levelling properties

...it permits higher current densities

...it reduces labor costs

that's why it's the most practical substitute base for chrome plating

The PR Process* plus Wes-X addition agent meet, to a remarkable degree today's requirements for a heavier, brighter cyanide copper deposit as a substitute undercoating for chrome. The high levelling properties of the PR and Wes-X copper deposit eliminates in most cases the need for buffing. Steel and die cast parts can move without interruption directly from copper to chrome. When buffing is necessary it becomes a mere wiping operation.

PR employs the principle of periods of current reversal during a conventional plating operation. Wes-X is an addition agent of inorganic, metallic compounds, including cyanides. Its use completely eliminates organic additions to the bath. The bath is outstanding in its ease of control. All constituents can be accurately analyzed. The metal and chemical content is not critical, permitting a wide latitude in operation.

By varying the concentration of Wes-X, the composition of the plating solution and the PR cycle, cyanide copper deposits of any desired physical properties can be produced.

Investigate this revolutionary process now, it may be the answer to your present chrome plating production. For full details ask for bulletin on "Technical Instructions for the H-VW-M Bright Copper Plating Process."

PR plus Wes-X is another facet of H-VW-M's *Platemanship*—the ability to meet every requirement of the industry in all phases of pickling, polishing, buffing, cleaning, anodizing and plating.

*PR Plating Process is a development of Westinghouse Electric Corp., covered by Patents #2451340 and #2451341. License agreements are available through H-VW-M.

HANSON-VAN WINKLE-MUNNING COMPANY, MATAWAN, NEW JERSEY

PLANTS AT MATAWAN, N. J. • ANDERSON, INDIANA • SALES OFFICES ANDERSON • BOSTON • CHICAGO CLEVELAND • DAYTON • DETROIT • GRAND RAPIDS • MATAWAN • MILWAUKEE • NEW HAVEN NEW YORK • PHILADELPHIA • PITTSBURGH • ROCHESTER • SPRINGFIELD (MASS.) • STRATFORD (CONN.) • UTICA

H·VW·M

7918

INDUSTRY'S WORKSHOP FOR THE FINEST IN PLATING AND POLISHING PROCESSES • EQUIPMENT • SUPPLIES

STANDARD PIPE, T. & C.

BUTTWELD Size	List	Pounds	Carload Discounts from List, % —Black—			—Galvanized—		
Inches	Per Ft	Per Ft	A	B	C	D	E	F
⅛	5.5c	0.24	34.0	32.0	...	+0.5	+2.5	...
¼	6.0	0.42	28.5	26.5	...	+3.5	+5.5	...
⅜	6.0	0.57	23.5	21.5	...	+10.0	+12.0	...
½	8.5	0.85	36.0	34.0	35.0	12.0	10.0	11.0
¾	11.5	1.18	39.0	37.0	38.0	16.0	14.0	15.0
1	17.0	1.68	41.5	39.5	40.5	19.5	17.5	18.5
1¼	23.0	2.28	42.0	44.0	41.0	20.5	22.5	19.5
1½	27.5	2.78	42.5	41.5	41.5	21.5	20.0	20.5
2	37	3.68	43.0	41.0	42.0	22.0	20.0	21.0
2½	58.5	5.82	43.5	41.5	42.5	23.0	21.0	22.0
3	76.5	7.62	43.5	41.5	42.5	23.0	21.0	22.0

Column A: Etna, Pa. N2 and 36½% on 3½", 4"; Butler, Pa. ⅛-⅜", F6; Benwood, W. Va., 3½ points lower on ⅛", 1½ points lower on ¼", and 2 points lower on ⅜"; W10; Sharon, Pa. M6, 1 point higher on ⅛", 2 points lower on ¼" and ⅜". Wheatland, Pa. W9, 2 points lower on ⅛", ¼", ⅜"; Following make ½" and larger: Lorain, O., N3; Youngstown R2 and 36¼% on 3½" and 4"; Youngstown Y1; Aliquippa, Pa. J5; Fontana, Calif. K1 quotes 11½ points lower on ½" and larger continuous weld and 24% on 3½" and 4".

Columns B & E: Sparrows Point, Md. B2.

Columns C & F: Indiana Harbor, Ind., Y1; Alton, Ill., (Gary base) 2 points lower discount L1.

Column D: Butler, Pa. F6, ⅛-⅜"; Benwood, W. Va. W10, except plus 4% on ⅛", plus 6% on ¼", plus 13% on ⅜" and 15.5% on 3½", 4"; Sharon, Pa. M6, plus 2.5 on ⅛", 1 point lower on ½", ¾", 1½ points lower on 1" and 1¼", 2 points lower on 1½", 2", 2½" and 3". Wheatland, Pa. W9, add 2 points on ⅛", ¼", ⅜", 1 point lower on ½", 2 points lower on 1", 1½", 2", 1½ points lower on 1¼", 2½", 3". Etna, Pa. N2 and 15.5% on 3½", 4". Following quote only on ½" and larger: Lorain, O. N3; Youngstown R2, and 15½% on 3½" and 4"; Youngstown Y1. Aliquippa, Pa. J5 quotes 1 point lower on ¾", 2 points lower on 1", 1½", 2", 1½ points lower on 1¼", 2½" and 3".

SEAMLESS AND ELECTRIC WELD Size	List	Pounds	Carload Discounts from List, % Seamless Black	Seamless Galv.	Elec. Weld Black	Elec. Weld Galv.
Inches	Per Ft	Per Ft	A	B	C	D
2	37.0c	3.68	29.5	8.0	29.5	8.0
2½	58.5	5.82	32.5	11.5	32.5	11.5
3	76.5	7.62	32.5	11.5	32.5	11.5
3½	92.0	9.20	34.5	13.5	34.5	13.5
4	$1.09	10.89	34.5	13.5	34.5	13.5
5	1.48	14.81	37.0	16.0	37.0	16.0
6	1.92	19.18	37.0	16.0	37.0	16.0

Column A: Aliquippa J5; Ambridge N2; Lorain N3; Youngstown Y1.

Column B: Aliquippa J5 quotes 1½ pts lower on 2", 1 pt lower on 2½-6 in.; Lorain N3; Youngstown Y1.

Columns C & D: Youngstown R2.

BOILER TUBES

Net base, c.l. prices, dollars per 100 ft. mil; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Ga.	—Seamless— H.R.	C.D.	Elec. Weld H.R.	C.D.
1	13	13.45	16.47	15.36	15.36
1¼	13	16.09	19.71	15.61	18.19
1½	13	17.27	21.15	17.25	20.30
1¾	13	19.29	23.62	19.62	23.09
2	13	21.62	26.48	21.99	25.86
2¼	13	24.35	29.82	24.50	28.84
2½	12	26.92	32.97	26.98	31.76
2½	12	28.65	36.32	29.57	34.76
2¾	12	32.11	39.33	31.33	36.84
3	12	34.00	41.64	32.89	38.70

CLAD STEELS

(Cents per pound)

Cladding Stainless	—Plates— Carbon Base 10%	20%	—Strip— Cold-Rolled Carbon Base Both Sides	—Sheets— Carbon Base 10%	20%	Cu Base Both Sides
302	....	....	....	19.75	26.24–27.50	77.00
304	25.00	29.50	....	24.50	27.50–27.77	77.00
309	30.50	35.00	....	....	....	....
310	36.50	41.00	....	....	....	144.00
316	29.50	34.00	....	26.00	35.92–36.50	....
317	34.50	39.00	....	....	....	....
318	33.50	38.00	....	....	....	....
321	26.50	31.00–32.00	....	23.00	33.00	111.00
347	27.50	32.00	....	24.00	33.50–33.83	130.00
405	21.25	27.75	....	....	....	....
410	20.75	27.25	....	....	....	....
Nickel	33.55	45.15	41.00	54.00	....	....
Inconel	41.23	54.18	....	....	....	165.00
Monel	34.93	46.28	....	....	....	....
Copper*	....	23.70†	29.65‡	....	....	....

* Deoxidized. † 20.20c for hot-rolled. ‡ 26.40c for hot-rolled. Production points for carbon base products: Stainless plates, sheet, Conshohocken, Pa. A3 and New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; nickel, copper-clad strip, Carnegie, Pa., S18. Production point for copper-base sheets is Carnegie, Pa. A13.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants; per cent off list for less than case lots to consumers)

6 in. and shorter:	
½-in. & smaller diam.	15
⅝-in. & ⅞-in.	18.5
1-in. and larger	17.5
Longer than 6 in.:	
All diams.	14
Lag bolts, all diams.:	
6 in. and shorter	23
over 6 in. long	21
Ribbed Necked Carriage	18.5
Blank	34
Plow	34
Step, Elevator, Tap and Sleigh Shoe	21
Tire bolts	12
Boiler & Fitting-Up bolts	31

NUTS

H.P. & C.P. Square:	Reg.	Hvy.
½-in. & smaller	15	15
⅝-in. & ⅞-in.	12	6.5
1-in.-1¼-in.	9	1
1⅛-in. & larger	7.5	1
H.P. Hex.:		
½-in. & smaller	26	22
⅝-in. & ⅞-in.	16.5	6.5
1-in.-1¼-in.	12	2
1⅛-in. & larger	8.5	2
C.P. Hex.:		
½-in. & smaller	26	22
⅝-in. & ⅞-in.	23	17.5
1-in. & 1⅛-in.	19.5	12
1¼-in. & larger	12	6.5

SEMIFINISHED NUTS

American Standard

(Per cent off list for less than case or keg quantities)	Reg.	Hvy.
½-in. & smaller	35	28.5
⅝-in. & ⅞-in.	29.5	22
1-in.-1½-in.	24	15
1⅝-in. & larger	13	8.5
⅞-in. & smaller	....	Light 35
1-in. to ⅞-in.	....	28.5
1¼-in. to 1½-in.	....	26

STEEL STOVE BOLTS

(F.o.b. plant; per cent off list in packages)

Plain finish	48 & 10
Plated finishes	31 & 10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:	
⅝-in. & smaller	42
¾-in. through 1 in.	34
Longer than 6 in.:	
⅝-in. & smaller	26
¾-in. through 1 in.	4

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam. x 6 in. and shorter	38
1 in. and smaller diam. x over 6 in.	26

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller	35
¼-in. diam. & larger	16
N.F. thread, all diams.	10

RIVETS

F.o.b. midwestern plants

Structural ½-in., larger 7.85c

⅝-in. under ..... 36 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers ..List to list-plus-$1.

FLUORSPAR

Metallurgical grade, f. o. b. shipping point, in Ill., Ky., net tons, carloads, effective CaF₂ content, 70%, $43; 60%, $40.

Imported, net ton, duty paid, metallurgical grade, $33-$35.

ELECTRODES

(Threaded, with nipples, unboxed, f.o.b. plant)

GRAPHITE

——Inches—— Diam.	Length	Cents per lb
17, 18, 20	60, 72	17.83
8 to 16	48, 60, 72	17.85
7	48, 60	19.57
6	48, 60	20.95
	CARBON	
35, 40	110	8.03
30	65, 84, 110	8.03
24	72 to 104	8.03
17 to 20	34, 90	8.03

STAINLESS STEEL

Type	Sheets	C.R. Strip	Bars Wire Structurals
301	41.00	34.00	31.25
302	41.25	36.75	31.50
303	43.25	40.25	34.00
304	43.25	38.75	33.00
309	56.00	55.00	44.75
316	57.00	59.00	49.25
321	49.25	48.25	37.00
347	53.75	52.25	41.50
410	36.50	30.50	25.75
416	37.00	37.00	26.25
420	44.00	47.00	31.25
430	39.00	31.00	26.25
501	27.50	26.00	14.25
502	28.50	27.00	15.25

Bait., Types 301-347 sheet, quotes slight variations on Types 301-347.

Bridgeville, Pa., bars, wire, except 303 and 309 E2.

Brackenridge, Pa., Sheets A4 sheets & strip U4.

Butler, Pa., sheets and strip except Types 303, 309, 416, 420, 501 & 502, A10.

Carnegie, Pa., sheets and strip except Types 303, 416, 501 & 502 and 0.25c lower on Types 302, 304, 321, 347; 0.50c lower on Types 309 and 316 S18.

Cleveland, strip A7.

Detroit, strip M1 quotes 34.00c on Type 301; 36.50c, 302; 38.50c, 304; 58.50c, 316; 52.00c, 347; 30.50c, 410; 31.00c, 430.

Dunkirk, N. Y., bars, wire A4 quotes slight variations on Types 301-347.

Duquesne, Pa., bars U5.

Fort Wayne, Ind., bars and wire, except Types 501 & 502 J6 quotes slight variations on Types 301-347.

Gary, Ind., sheets except Type 416 U5.

Harrison, N. J., strip and wire C18.

Massillon, O., all items, R2.

McKeesport, Pa., strip, Type 410; bars & wire, Types 410 through 430 and 31.25c on Type 302, 33.75c on 303, 32.75c on 304, 48.75c on 316, 36.75c on 321, 41.25c on 347 F2.

McKeesport, Pa., bars, sheets except Type 416 U5.

Middletown, O., sheets and strip except Types 303, 416, 420, 501 and 502 A10.

Midland, sheets & strip C18.

Munhall, Pa., bars U5.

Pittsburgh, sheets C18.

Reading, Pa., strip except 34.25c on Type 301 and 56.00c on 309; bars, except 31.50c on Type 301 and 45.25c on 309 C4.

Sharon, Pa., strip, except Types 303, 309, 416, 501, 502 and 34.25c on Type 301 S3.

So. Chicago, Ill., bars & structurals U5.

Syracuse, N. Y., bars, wire & structurals C18.

Titusville, Pa., bars, U4.

Wallingford, Conn., strip, W2 quotes 0.25c higher.

Washington, Pa., bars, sheets & strip, except 0.25c higher on Type 301 J3.

Washington, Pa., Types 301 through 347 sheets & strip except 303, 309; 316 sheets 62.00c, strip 64.00c W4.

Watervliet, N. Y., structurals & bars A4 quotes variations on Types 301-347.

Waukegan, bars & wire A7.

West Leechburg, Pa., strip, A4 quotes slight variations on Types 301-347.

Youngstown, strip, except Types 303, 309, 316, 416, 501 and 502 and 34.25c on Type 301.

COAL CHEMICALS

Spot, cents per gallon, ovens

Pure benzol 30.00-35.00

Toluol, one deg...26.00-33.00

Industrial xylol .25.00-33.50

Per ton bulk, ovens

Sulphate of ammonia $32-$45

Cents per pound, ovens

Phenol, 40 (carlots, non-returnable drums) ...17.25

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted.)

Sponge iron	Cents
98+% Fe, carlots	17.00
Swedish, c.l.f. New York, in bags	8.85-9.95
Electrolytic Iron:	
Annealed, 99.5% Fe	42.50
Unannealed, 99 + % Fe	36.50
Unannealed, 99 + % Fe (minus 325 mesh)	58.50
Powder Flakes	48.50
Carbonyl Iron:	
97.9-99.8%, size 5 to 10 microns	83.00-148.00
Aluminum:	
Carlots, freight allowed	29.50
Atomized, 500 lb drums, freight allowed	33.50
Antimony	75.85
Brass, 10-ton lots	30.00-33.25
Bronze, 10-ton lots	51.25-60.00
Phosphor-Copper, 10 ton lots	50.00
Copper:	
Electrolytic	37.25-46.25
Reduced	33.75-37.00
Lead	25.50
Magnesium	75.00-85.00
Manganese:	
Minus 100-mesh	57.00
Minus 35 mesh	52.00
Minus 200 mesh	62.00
Nickel unannealed	86.00
Nickel-Silver, 10-ton lots	45.00
Silicon	38.50
Solder (plus cost of metal)	8.50
Stainless Steel, 302	83.00
Zinc, 10-ton lots	23.00-30.50
Tungsten	Dollars
Melting grade, 99%, 60 to 200 mesh, freight allowed:	
1000 lb and over	6.00
Less than 1000 lb	6.15
98.8% minus 65 mesh, freight allowed:	
1000 lb and over	4.15
Less than 1000 lb	4.25
Molybdenum:	
99.9%, minus 200 mesh	3.25
Chromium, electrolytic 99% Cr min.	3.50

METALLURGICAL COKE

Price per net ton

BEEHIVE OVENS

Connellsvill, fur.	$14.50-15.00
Connelsvill, fdry.	17.00-18.00
New River foundry	21.30
Wise county, foundry	15.95
Wise county, furnace	13.20

OVEN FOUNDRY COKE

Kearny, N. J., ovens	$22.75
Everett, Mass., ovens New England, del.	*24.80
Chicago ovens	23.00
Chicago, del	24.50
Terre Haute, ovens	22.50
Milwaukee, ovens	23.75
Indianapolis, ovens	22.75
Chicago, del.	26.42
Cincinnati, del.	25.85
Detroit, del	26.85
Ironton, O., ovens	22.50
Cincinnati, del.	25.12
Painesville, O., ovens	24.00
Cleveland, del.	25.82
Erie, Pa., ovens	23.50
Birmingham, ovens	20.30
Birmingham, del.	21.60
Philadelphia, ovens	22.70
Nevilleisland, Pa., ovens	23.00
Swedeland, Pa., ovens	22.60
St. Louis, ovens St. Louis, del.	25.40
Portsmouth, O., ovens	22.50
Cincinnati, del.	25.12
Detroit, ovens	24.00
Detroit, del.	25.00
Buffalo, del.	26.89
Flint, del.	26.59
Pontiac, del.	25.47
Saginaw, del.	26.92

* Or within $4.15 freight zone from works.

On the job!

Our volunteer speakers are saving thousands of lives *today* . . . in factories and business offices . . . at neighborhood and civic centers . . . at social, fraternal and service group meetings all over this land . . . by showing people what they can do to protect themselves and their families against death from cancer.

In laboratories and hospitals, from coast to coast, our volunteer dollars are supporting hundreds of research and clinical projects that will save countless more lives *tomorrow*.

To find out what you yourself can do about cancer, or if you want us to arrange a special educational program for your neighbors, fellow-workers or friends, just telephone the American Cancer Society office nearest you or address your letter to "Cancer" in care of your local Post Office. One of our volunteer or staff workers will be on the job to help you.

American Cancer Society

WAREHOUSE STEEL PRODUCTS

(Prices, cents per pound, for delivery within switching limits, subject to extras)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140‡		Carbon	Floor
New York (city)	6.27	7.29	8.44	6.59	...	6.42	7.29	9.25	6.40	6.58	8.04
New York(c'try)	5.97	6.99	8.14	6.29	...	6.12	6.99	8.95	6.10	6.28	7.74
Boston (city) ..	6.40	7.20	8.49	6.35	...	6.25	7.04	9.25	6.40	6.98	7.88
Boston (c'try).	6.20	7.00	8.29	6.15	...	6.05	6.84	9.05	6.20	6.78	7.68
Phila. (city) ..	6.15	7.05	8.25	6.35	...	6.30	7.11	8.90	6.15	6.30	7.40
Phila. (c'try)..	5.90	6.80	8.00	6.10	...	6.05	6.86	8.65	5.90	6.05	7.15
Balt. (city) ...	5.80	7.04	8.27	6.24	...	6.24	7.09	...	6.34	6.00	7.84
Balt. (c'try ..	5.60	6.84	8.07	6.04	...	6.04	6.89	...	6.14	5.80	7.44
Norfolk, Va. ..	6.50	...	...	6.70	...	6.55	7.70	...	6.60	6.50	8.00
Richmond, Va..	5.90	...	8.10	6.10	...	6.10	6.90	...	6.30	6.05	7.80
Wash. (w'hse).	6.02	7.26	8.49	6.46	...	6.46	7.26	...	6.56	6.22	7.86
Buffalo (del.)..	5.80	6.60	8.29	6.06	...	5.80	6.65	10.65††§	6.00	6.25	7.55
Buffalo (w'hse)	5.60	6.40	8.09	5.86	...	5.60	6.45	10.45††§	5.80	6.05	7.35
Pitts. (w'hse)..	5.60	6.40*	7.75	5.65-5.95	6.90	5.55	6.40	10.10††	5.70	5.75	7.00
Detroit (w'hse)	5.45-5.78	6.53-6.80	7.99	5.94-5.95	7.75	5.84	6.56	8.91	6.09	6.19-6.35	7.28
Cleveland (del.)	5.80	6.60	8.30	5.89	7.10	5.77	6.60-6.70	8.91	10.02	6.12	7.82
Cleve. (w'hse).	5.60	6.40	8.10	5.69	6.90	5.57	6.40-6.50	8.71	5.82	5.92	7.12
Cincin. (city)..	6.02	6.59	7.34	5.95	...	5.95	6.51	...	6.24	6.34	7.50
Chicago (city).	5.80	6.60	7.95	5.75	...	5.75	6.50	10.30	5.90	6.00	7.20
Chicago (w'hse)	5.60	6.40	7.75	5.55	...	5.55	6.30	10.10	5.70	5.80	7.00
Milwau. (city).	5.94	6.74	8.09	5.89	...	5.89	6.74	10.44	6.04	6.14	7.34
Milwau. (c'try)	5.74	6.54	7.89	5.69	...	5.69	6.54	10.24	5.84	5.94	7.14
St. Louis (del.)	6.05	6.85	8.20	6.00	...	6.00	6.85	10.55	6.23	6.33	7.53
St. L. (w'hse).	5.85	6.65	8.00	5.80	...	5.80	6.65	10.35	6.03	6.13	7.33
Kans. City(city)	6.40	7.20	8.40	6.35	...	6.35	7.20	...	6.50	6.60	7.80
KansCity(w'hse)	6.20	7.00	8.20	6.15	...	6.15	7.00	...	6.30	6.40	7.60
Birm'hm (city).	5.75	6.55	6.90‡	5.70	...	5.70	7.53	...	5.85	6.10	8.25
Birm'hm(w'hse)	5.60	6.40	6.75‡	5.55	...	5.55	7.53	...	5.70	5.95	8.23
Los Ang. (city)	6.55	8.10	9.05‡	6.60	8.90	6.55	7.75	...	6.55	6.60	9.20
L. A. (w'hse).	6.35	7.90	8.85‡	6.40	8.70	6.35	7.55	...	6.35	6.40	8.70
Seattle-Tacoma.	6.65	7.80‡	8.90‡	6.60	...	6.45	8.20	...	6.45	6.50	8.60
San Francisco..	7.05	8.60‡	9.20‡	7.30	...	6.75	9.10	11.15	6.65	6.75	8.80

Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes extra for 10 gage; § as rolled; †† as annealed. Base quantities, 2000 to 9999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; ²—500 to 1499 lb; ³—450 to 1499 lb; ⁴—3500 lb and over; ⁵—1000 to 1999 lb.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (natural), lower lake ports.

After adjustment for analysis, prices will be increased or decreased as the case may be for increases or decreases after Dec. 2, 1950, in applicable lake vessel rates, upper lake rail, freights, dock handling charges and taxes thereon.

Old range bessemer	$8.70
Old range nonbessemer	8.55
Mesabi bessemer	8.45
Mesabi nonbessemer	8.30
High phosphorus	8.30

Eastern Local Ore

Cents per unit, del. E Pa.

Foundry and basic 56-62% concentrates contract	17.00

Foreign Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	17.00
Long-term contract	15.00
North African hematities	17.00
Brazilian iron ore, 68-69%	24.00-25.00

Tungsten Ore

Net ton unit, duty paid

Foreign wolframite and scheelite, per net ton unit	$65.00
Domestic scheelite, mines	65.00

Manganese Ore

Manganese, 48% nearby, $1.18-$1.22 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48% ore are being received from some sources at 79.8-81.6c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African	
48% 2.8:1	$32.50
48% 3:1	35.00-36.00
48% no ratio	26.00
South African Transvaal	
44% no ratio	$27.00-28.00
48% no ratio	34.00-35.00
Brazilian	
44% 2.5:1 lump	$32.00
Rhodesian	
45% no ratio	$20.00-21.00
48% no ratio	26.00
48% 3:1 lump	35.00-36.00
Domestic—rail nearest seller	
48% 3:1	$39.00

Molybdenum

Sulphide concentrates per lb, molybdenum content, mines	$1.00

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 21.75c per lb of contained Cr. c.l., packed 22.65c, ton lot 23.80c, less ton 25.20c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%,) Contract, carload, lump, bulk, max. 0.03% C 33.60c per lb of contained Cr, 0.04% C 31.50c, 0.06% C 30.50c, 0.10% C 30.00c, 0.15% C 29.75c, 0.20% C 29.50c, 0.50% C 29.25c, 1% C 29.00c, 1.50% C 28.85c, 2% C 28.75c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High Carbon: (Cr 62-66%, C 5-7%). Contract, c.l. 8 M x D, bulk, 23.25c per lb of contained Cr. C.l., packed 24.15c, ton 25.50c, less ton 27.25c. Delivered Spot, add 0.25c.

Foundry Ferrochrome, Low Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max.) Contract, carload, packed, 8 M x D, 16.35c per lb of alloy; ton lot 17.2c; less ton lot, 18.4c, delivered; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max.) Contract, carload, lump, 4" x down and 2" x down, bulk, 21.75c per lb of contained chromium plus 12.4c per pound of contained silicon; 1" x down, bulk 21.90c per pound of contained chromium plus 12.60c per pound of contained silicon, F.o.b. plant; freight allowed to destination.

Ferrochrome Silicon, No. 2: (Cr 36-39%, Si 36-39%, Al 7-9%, C 0.05% max.) 21.75c per lb of contained silicon plus 12.4c per lb of contained silicon plus aluminum 3" x down, delivered.

Chromium Metal: (Min. 97% Cr and 1% Fe) Contract carload, 1" x D; packed, max 0.50% C grade, $1.08 per lb of contained chromium ton lot $1.10, less ton $1.12. Delivered. Spot add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.00c per lb of contained Si; packed 21.40c; ton lot 22.50c, f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 12.40c per lb of contained Si, carload packed 14.0c, ton lot 15.45c, less ton 17.1c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 14.3c per lb of contained Si, carload packed 15.6c, ton lot 16.75c, less ton 18.0c. Delivered. Spot, add 0.8c.

Note: Current prices on zirconium, calcium and briquetted alloys appeared on page 171, Nov. 13 issue; manganese, titanium and "other" ferroalloys, page 139, Nov. 29. Refractories prices were published on page 171, Nov. 19.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.) Add 0.7c to 85% ferrosilicon prices.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 17.5c per lb of contained Si, carload packed 18.7c, ton lot 19.65c, less ton 20.7c. Delivered. Spot, add 0.25c.

Silicon Metal: (Min. 97% Si and 1% max. Fe). C.l. lump, bulk, regular 20.0c per lb of Si, c.l. packed 21.2c, ton lot 22.1c, less ton 23.1c. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade analyzing min. 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe.) Contract, basis f.ob. Niagara Falls, N. Y., lump, carload, bulk, 9.90c per lb of alloy, ton lots packed 11.30c, 200 to 1999 lb 11.65c, smaller lots 12.15c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 8-12% max., C 3-3.5% max.). Contract, any quantity, $3.10 per lb of contained V. Delivered. Spot, add 10c. **Crucible-Special Grades** (V 35-55%, Si 2-3.5% max., C 0.5-1% max.), $3.20. **Primos and High Speed Grades** (V 35-55%, Si 1.50% max., C 0.20% max.) $3.30.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.28 per lb contained V_2O_5, freight allowed. Spot, add 5c.

BORON ALLOYS

Ferroboron: (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Contract, 100 lb or more, 1"x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot, add 5c. F.o.b. Washington, Pa., prices 100 lb and over are as follows: Grade A (10-14% B) 75c per pound; Grade B (14-18% B) $1.20; Grade C (19% min. B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%) contract, lump, carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

TUNGSTEN ALLOYS*

Ferrotungsten: (70-80%). 10,000 lb W or more, $5.00 per lb of contained W; 20,000 lb W to 10,000 lb W, $5.10; less than 2000 lb W, $5.22.

Tungsten Powder: Carbon Reduced; (W 98.8% min.) 1000 lb or more, $6.00 per lb of contained W; less than 1000 lb W, $6.15.

*Government ceiling prices, effective May 7, 1951, f.o.b. Niagara Falls, N. Y., basis.

CEILING PRICES, IRON AND STEEL SCRAP

Prices as set forth in Office of Price Stabilization ceiling price regulation No. 5, as amended Oct. 23, 1951

STEELMAKING SCRAP COMPOSITE

Nov. 29	$43.00
Nov. 21	43.00
Oct. 1951	43.60
Nov. 1950	41.33
Nov. 1946	22.22

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

Basing point ceiling prices per gross ton from which maximum shipping prices are computed on scrap of dealer and industrial origin; and from which ceiling on-line and ceiling delivered prices are computed on scrap of railroad origin.

Basing Point	Grade 1 No. 1 Bundles Dealer, Industrial	No. 1 Heavy Melt Railroad
Alabama City, Ala.	$39.00	$41.00
Ashland, Ky.	42.00	44.00
Atlanta, Ga.	39.00	41.00
Bethlehem, Pa.	42.00	44.00
Birmingham, Ala.	39.00	41.00
Brackenridge, Pa.	44.00	46.00
Buffalo, N. Y.	43.00	45.00
Butler, Pa.	44.00	46.00
Canton, O.	44.00	46.00
Chicago, Ill.	42.50	44.50
Cincinnati, O.	43.00	45.00
Claymont, Del.	42.50	44.50
Cleveland, O.	43.00	45.00
Coatesville, Pa.	42.50	44.50
Conshohocken, Pa.	42.50	44.50
Detroit, Mich.	41.15	43.15
Duluth, Minn.	40.00	42.00
Harrisburg, Pa.	42.50	44.50
Houston, Tex.	37.00	39.00
Johnstown, Pa.	44.00	46.00
Kansas City, Mo.	39.50	41.50
Kokomo, Ind.	42.00	44.00
Los Angeles	35.00	37.00
Middletown, O.	43.00	45.00
Midland, Pa.	44.00	46.00
Minnequa, Colo.	38.00	40.00
Monessen, Pa.	44.00	46.00
Phoenixville, Pa.	42.50	44.50
Pittsburg, Calif.	35.00	37.00
Pittsburgh, Pa.	44.00	46.00
Portland, Oreg.	35.00	37.00
Portsmouth, O.	42.00	44.00
St. Louis, Mo.	41.00	43.00
San Francisco	35.00	37.00
Seattle, Wash.	35.00	37.00
Sharon, Pa.	44.00	46.00
Sparrows Pt., Md.	42.00	44.00
Steubenville, O.	44.00	46.00
Warren, O.	44.00	46.00
Weirton, W. Va.	44.00	46.00
Youngstown, O.	44.00	46.00

Differentials from Base

Differentials per gross ton for other grades of dealer and industrial scrap:

O-H and Blast Furnace Grades

2. No. 1 Busheling	Base
3. No. 1 Heavy Melting	—$1.00
4. No. 2 Heavy Melting	— 1.00
5. No. 2 Bundles	— 1.00
6. Machine Shop Turnings	—10.00
7. Mixed Boring & Short Turnings	— 6.00
8. Shoveling Turnings	— 6.00
9. No. 2 Busheling	— 4.00
10. Cast Iron Borings	— 6.00

Elec. Furnace and Fdry. Grades

11. Billet, Bloom & Forge Crops	+ 7.50
12. Bar Crops & Plate	+ 5.00
13. Cast Steel	+ 5.00
14. Punchings & Plate Scrap	+ 2.50
15. Electric Furnace Bundles	+ 2.00
Cut Structurals & Plate:	
16. 3 feet and under	+ 3.00
17. 2 feet and under	+ 5.00
18. 1 foot and under	+ 6.00
19. Briquetted Cast Iron Borings	Base
Foundry, Steel:	
20. 2 feet and under	Base
21. 1 foot and under	+ 2.00
22. Springs and Crankshafts	+ 1.00
23. Alloy Free turnings	— 3.00
24. Heavy Turnings	— 1.00
25. Briquetted Turnings	Base
26. No. 1 Chemical Borings	— 3.00
27. No. 2 Chemical Borings	— 4.00
28. Wrought Iron	+10.00
29. Shafting	+10.00
30. Hard Steel cut 2 ft & under	+ 5.00
31. Old Tin & Terne Plated Bundles	—10.00

Unprepared Grades

When compressed constitutes:

32. No. 1 Bundles	— 6.00
33. No. 2 Bundles	— 9.00
34. Other than material suitable for hydraulic compression	— 8.00

Restrictions on Use

(1) Prices for Grades 11 and 23 may be charged only when shipped to a consumer directly from an industrial producer; otherwise ceiling prices shall not exceed prices established for Grades 12 and 8, respectively. (2) Prices established for Grades 26 and 27 may be charged only when sold for use for chemical or annealing purposes, and in the case of Grade 27, for briquetting and direct charge into an electric furnace; otherwise ceiling prices shall not exceed price established for Grade 10. (3) Prices established for Grade 28 may be charged only when sold to a producer of wrought iron; otherwise ceiling price shall not exceed ceiling price for corresponding grade of basic open-hearth. (4) Premiums for Grades 11-18, 20 and 21 may be charged only when sold for use in electric and open-hearth furnaces or foundries. (5) Prices for Grade 29 may be charged only when sold for forging or rerolling purpose. (6) Prices for Grade 30 may be charged only when sold to a gray iron foundry; otherwise price for Grade 20 will prevail.

Special Pricing Provisions

(1) Sellers of Grades 26 and 27 may make an extra charge of $1.50 per ton for loading in box cars, or 75 cents per ton for covering gondola cars with a weather-resistant covering.

(2) Ceiling price of pit scrap, ladle scrap, salamander scrap, skulls, skimmings or scrap recovered from slag dumps and prepared to charging box size, shall be computed by deducting from the price of No. 1 heavy melting steel of dealer and industrial origin, the following amounts: Where iron content is 85% and over, $6; 75% and over, $10; less than 75%, $12.

(3) Ceiling price of any inferior grade of scrap not listed shall not exceed the price of No. 1 bundles less $15.00.

Differentials from Base

Differentials per gross ton above or below the price of Grade 1 (No. 1 railroad heavy melting steel) for other grades of railroad steel scrap.

2. No. 2 Heavy melting Steel	—$2.00
3. No. 2 Steel Wheel	Base
4. Hollow Bored Axles and loco. axles with keyways between the wheelseats	Base
5. No. 1 Busheling	— 3.50
6. No. 1 Turnings	— 3.00
7. No. 2 Turnings, Drillings & Borings	—12.00
8. No. 2 Cast Steel and uncut wheelcenters	— 6.00
9. Uncut Frogs, Switches	Base
10. Flues, Tubes & Pipes	— 8.00
11. Structural, Wrought Iron and/or steel, uncut	— 6.00
12. Destroyed Steel Cars	— 8.00
13. No. 1 Sheet Scrap	— 9.50
14. Scrap Rails, Random Lengths	+ 2.00
15. Rerolling Rails	+ 7.00
Cut Rails:	
16. 3 feet and under	+ 5.00
17. 2 feet and under	+ 6.00
18. 18 inches and under	+ 8.00
19. Cast Steel, No. 1	+ 3.00
20. Uncut Tires	+ 2.00
21. Cut Tires	+ 5.00
Bolsters & Side Frames:	
22. Uncut	Base
23. Cut	+ 3.00
24. Angle, Splice Bars & Tie Plates	+ 5.00
25. Solid Steel Axles	+12.00
26. Steel Wheels, No. 3 oversize	Base
27. Steel Wheels, No. 3	+ 5.00
28. Spring Steel	+ 5.00
29. Couplers & Knuckles	+ 5.00
30. Wrought Iron	+ 8.00
31. Fireboxes	— 8.00
32. Boilers	— 6.00
33. No. 2 Sheet Scrap	—13.00
34. Carsides, Doors, Car Ends, cut apart	— 6.00
35. Unassorted Iron & Steel	— 6.00
36. Unprepared scrap, not suitable for hydraulic compression	— 8.00

Restrictions on Use

(1) Price established for Grade 15 may be charged only when purchased and sold for rerolling uses; otherwise, ceiling shall not exceed that for Grade 14. (2) Price established for Grade 30 may be charged only when sold to a producer of wrought iron; otherwise, ceiling shall not exceed that for No. 1 heavy melting steel. (3) Price for Grade 25 may be charged only when sold for rerolling and forging purposes; otherwise ceiling shall not exceed that for base grade (No. 1.)

CAST IRON SCRAP

Ceiling price per gross ton for following grades shall be f.o.b. shipping point:

Cast Iron:

1. No. 1 (Cupola)	$49.00
2. No. 2 (Charging Box)	47.00
3. No. 3 (Hvy. Breakable)	45.00
4. No. 4 (Burnt Cast)	41.00
5. Cast Iron Brake Shoes	41.00
6. Stove Plate	46.00
7. Clean Auto Cast	52.00
8. Unstripped Motor Blocks	43.00
9. Wheels, No. 1	47.00
10. Malleable	55.00
11. Drop Broken Machinery	52.00

Restrictions on Use

(1) Ceiling shipping point price which a basic open-hearth consumer may pay for No. 1 cast iron, clean auto cast, malleable or drop broken machinery cast shall be ceiling price for No. 2 charging box cast.

(2) Ceiling shipping point price which any foundry other than a malleable iron producer may pay for Grade 10 shall be ceiling price for No. 1 cast iron.

Preparation Charges

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of dealer or industrial origin authorized by OPS are:

(1) For preparing into Grades No. 3, No. 4 or No. 2, $8.
(2) For hydraulically compressing Grade No. 1, $6 per ton; Grade No. 5, $8.
(3) For crushing Grade No. 6, $3. For preparing into:
(4) Grade No. 25, $6.
(5) Grade No. 19, $6.
(6) Grades No. 12, No. 13, No. 14, No. 16, or No. 20, $10.
(7) Grade No. 17 or No. 21, $11.
(8) Grade No. 18, $12.
(9) For hydraulically compressing Grade No. 15, $8.
(10) For preparing into Grade No. 28, $10.

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of railroad origin shall be:
(1) For preparing into Grade No. 1 and Grade No. 2, $8.
(2) For hydraulically compressing Grade No. 13, $6.
For preparing into:
(3) Grade No. 16, $4.
(4) Grade No. 17, $5.
(5) Grade No. 18, $7.
(6) Grade No. 21, $4.
(7) Grade No. 23, $4.

Ceiling fees per gross ton which may be charged for intransit preparation of cast iron are limited to:
(1) For preparing Grade No. 8 into grade No. 7, $9.
(2) For preparing Grade No. 3 into Grade No. 11, $7.
(3) For preparing Grade No. 3 into Grade No. 1, $4.

Whenever scrap has arrived at its point of delivery and consumer engages a dealer to prepare such scrap, no fee may be charged for such services unless consumer obtains prior written OPS approval.

Commissions

No commission shall be payable to a broker in excess of $1.

Premiums for Alloy Content

No premium may be charged for alloy content except: $1.25 per ton for each 0.25% of nickel where scrap contains not less than 1% and not over 5.25% nickel; $2 per ton for scrap containing not less than 0.15 per cent molybdenum and $3 for scrap containing not less than 0.65% molybdenum; for scrap containing not less than 10% manganese, $4 for scrap in sizes larger than 12 x 24 x 8 in., and $14 for scrap cut in that size or smaller (applicable only if scrap is sold for electric furnace uses or on NPA allocation); $1 for scrap conforming to SAE 52100.

Switching Charges

Switching charges to be deducted from basing point prices of dealer, industrial and nonoperating railroad scrap, to determine ceiling shipping point prices for scrap originating in basing points are per gross ton:
Alabama City, Ala., 43c; Ashland, Ky., 47c; Atlanta, 51c.
Bethlehem, Pa., 52c; Birmingham, 50c; Brackenridge, Pa., 53c; Buffalo, N.Y., Butler, Pa., 65c.
Canton, O., 51c; Chicago (including Gary, Ind.), $1.34; Cincinnati (including Newport, Ky.), 65c; Claymont, Del. (including Chester, Pa.), 79c; Cleveland, 76c.
Coatesville, Pa., 50c; Conshohocken, Pa., 20c.
Detroit, 95c; Duluth, Minn., 50c.
Harrisburg, Pa., 51c; Houston, 57c.
Johnstown, Pa., 75c.
Kansas City, Mo., 78c; Kokomo, Ind., 51c.
Middletown, O., 26c; Midland, Pa., 75c; Minnequa, Colo., 33c; Monessen, Pa., 51c.
Phoenixville, Pa., 51c; Pittsburg, Calif., 65c; Pittsburgh (including Bessemer, Homestead, Duquesne, Munhall), 99c; Portland, Oreg., 52c; Portsmouth, O., 51c.
St. Louis (including Federal, Granite City, E. St. Louis, Madison, Ill.), 51c; San Francisco (including So. San Francisco, Niles, Oakland), 66c; Seattle, 59c; Sharon, Pa., 75c; Sparrows Point, Md., 20c; Steubenville, O., 51c.
Warren, Pa., 75c; Weirton, 76c.
Youngstown, 75c.

HAMILTON, ONT.

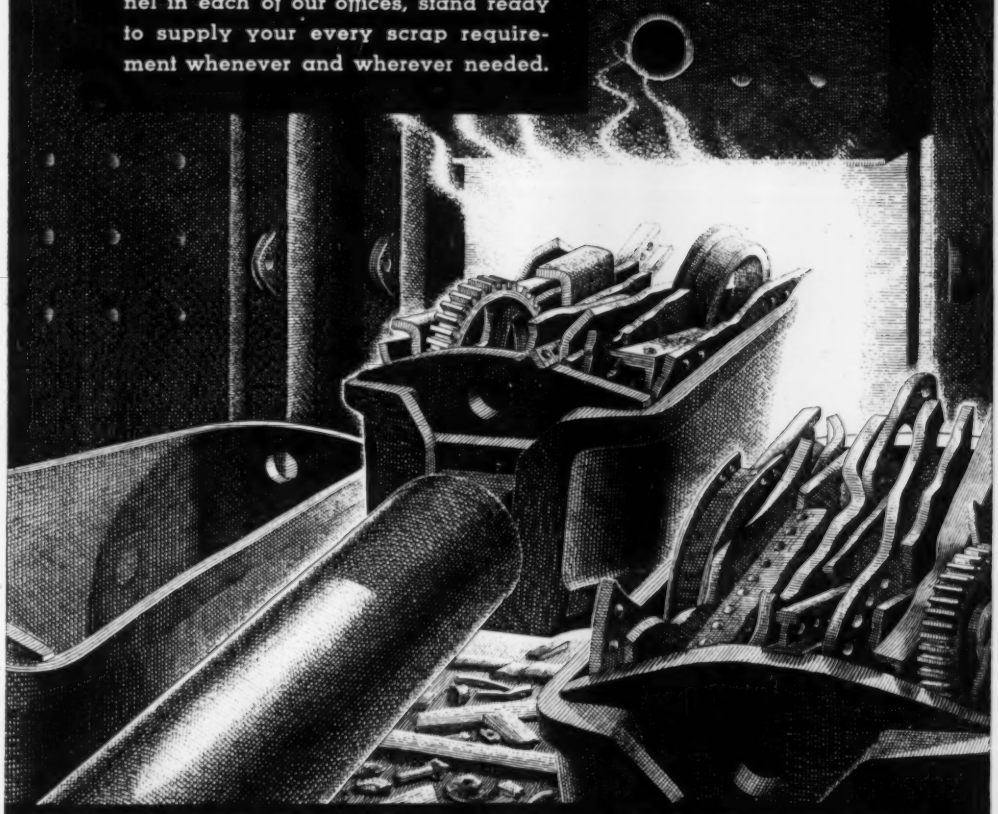
(Delivered Prices)

Heavy Melt	$35.00
No. 1 Bundles	35.00
No. 2 Bundles	35.00
Mechanical Bundles	31.50
Mixed Steel Scrap	31.00
Mixed Borings, Turnings	32.00
Rails, Remelting	35.00
Rails, Rerolling	38.00
Busheling	29.50
Bushelings new factory:	
Prep'd.	33.00
Unprep'd.	31.00
Short Steel Turnings	32.00
Cast Iron Grades*	
No. 1 Machinery Cast	55.00

* F.o.b. shipping point.

SCRAP *at your Service!*

The facilities and experienced personnel in each of our offices, stand ready to supply your every scrap requirement whenever and wherever needed.



LURIA BROTHERS AND COMPANY, INC.

CONSULT OUR NEAREST OFFICE FOR THE PURCHASE AND SALE OF SCRAP

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PITTSBURGH, PA. Oliver Building
BOSTON, MASS. Statler Building
CLEVELAND, OHIO 1022 Midland Bldg.
LEBANON, PENNA. Luria Building
PUEBLO, COLORADO 334 Colorado Bldg.
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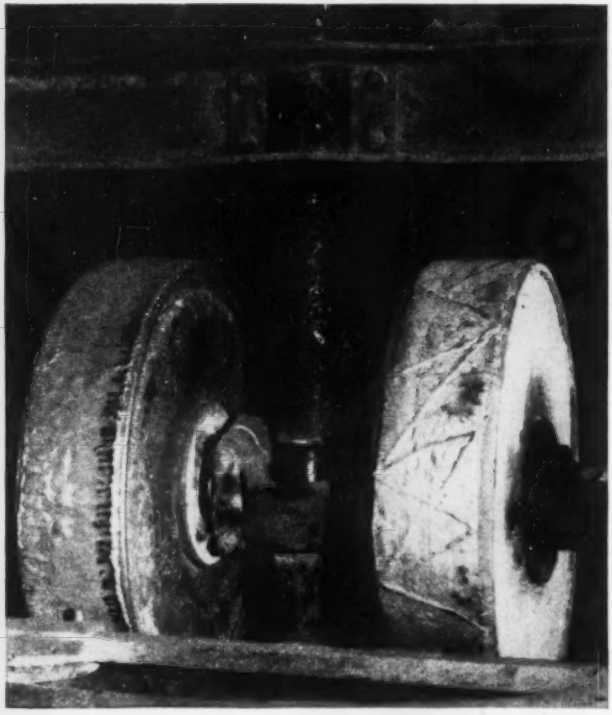
LEADERS IN IRON AND STEEL SCRAP SINCE 1889



6 Years on the Rock Pile ...and STILL SERVING TIME!

These hard-faced rock-crusher rolls have already outlasted unprotected rolls 12 times—and they are still in operation.

The hard-faced rolls on this rock-crusher mill have been in constant operation for six years. During this time, the rolls have been pulverizing such abrasive materials as ferro-alloys, ore, dolomite, feldspar, rock, sand, and clay used for making brick. Unprotected rolls, performing the same operations, had to be replaced every four or five months.

The serrated roll shown at the right in the photograph is the roughing roll used for initial grinding or milling. The smoother roll, at the left, is a finishing roll used to grind the abrasive materials into a powder. Both rolls were hard-faced with HAYNES STELLITE alloy by the metallic-arc process to protect them from abrasion.

The new 40-page booklet, "HAYNES Alloys—Hard-Facing Manual," gives the whole story on hard-facing. It includes information on what metals can be hard-faced, how to select the right HAYNES hard-facing material, step-by-step application procedures, and a list of typical industrial applications with recommended rods for each. If you would like a copy of this booklet, write to our nearest district office.

HAYNES TRADE-MARK *alloys*

Haynes Stellite Company
A Division of
Union Carbide and Carbon Corporation
UCC
General Offices and Works, Kokomo, Indiana
Sales Offices
Chicago — Cleveland — Detroit — Houston
Los Angeles—New York—San Francisco—Tulsa

"Haynes" and "Haynes-Stellite" are trade-marks of Union Carbide and Carbon Corporation.

The Metal Market

Tin prices declined in London and Singapore markets due to progress toward a truce on Korean front. Demand for metals to continue heavy, regardless of war developments

PROGRESS toward winning a truce on the Korean front caused a weakening in prices on tin markets outside the United States. Prices in Singapore and London declined, but remained well above the ceiling permitted in the United States.

Effects of a truce, even if it does develop ultimately into a final peace agreement, will be slight on other metal markets. Regardless of developments in Korea, momentum of the United States mobilization program will push industry at a fast clip for many months. Demand for copper, lead and zinc will continue to exceed supply, indicating retention of the present system of distribution until the government's defense program tapers.

Nickel Shortage Grows

Steadily mounting requirements for high nickel-bearing alloys in the jet aircraft program and in other defense production will increase the gravity of the nickel shortage for the stainless steel industry in the first quarter of 1952. Although efforts are being made by National Production Authority to hold the industry's nickel allocations for December to the levels of the two preceding months, there is some possibility that allocations may decline slightly this month.

The United States is stepping up its efforts to increase Cuban production of nickel. An airlift has been inaugurated between Norfolk, Va., and a naval installation near the United States government-owned Nicaro nickel plant in Cuba, built in 1942-43 and inoperative since 1946. This airlift is rushing materials to the plant, hastening reconstruction of the facilities. At the same time, a geological survey of mineral deposits in the area is being made by helicopter. The Nicaro plant cost the government about $32 million and has a designed capacity of about 16,000 net tons of nickel a year.

Strike Cuts Lead Supply

Shortage of lead has been intensified by the stoppage of operations at St. Joseph Lead Co.'s herculaneum smelter. The strike, now in its sixth week, has resulted in the loss of about 6000 tons of corroding lead.

Due to the scarcity of metal, Gould-National Batteries Inc., Depew, N. Y., was forced to curtail operations, despite the fact it is literally swamped with orders. Most of the current heavy battery demand comes from the government.

Shipments of automotive replacement batteries increased sharply in October to 2,493,000 units from 2,055,000 units in September. In October a year ago the all-time high was established at 3,007,000 units. Shipments for the first ten months came to 17,212,000 units compared with 18,420,000 in the like 1950 period.

Zinc Restrictions Tightened

Quantity of slab zinc which may be purchased monthly has been restricted further on smaller-sized orders without specific NPA authorization. Effective Jan. 1, the amount of zinc that can be purchased in any month without an allocation certificate is reduced from 20 tons to 10 tons. Applications for allocation certificates must be filed not later than the 15th of any month for delivery during the succeeding month.

NPA pointed out that continuing heavy demands for slab zinc in the defense program and in essential civilian production have created a seriously unbalanced supply-requirements situation. Since considerable tonnages of slab zinc are being shipped on orders ranging from 10 to 20 tons, it is anticipated that closer scrutiny of smaller-sized orders will make available a minimum of 750 tons of zinc for distribution to other plants, many of small size, which cannot now maintain their zinc operations at normal levels.

Magnesium Output Increases

Total primary magnesium produced in the first nine months of 1951 amounted to about 47 million pounds and the estimate for the fourth quarter is around 33 million pounds, making a total for the year of about 80 million pounds. This estimate was made by Perry D. Helser, chief, Magnesium and Titanium branch, Aluminum and Magnesium Division, NPA. He estimated production of secondary magnesium in 1951 at about 16 million pounds. Total production of primary and secondary magnesium for 1951 is estimated at about 97 million pounds compared with 43.4 million pounds in 1950, a rise of 125 per cent.

Production of primary magnesium in 1952 is estimated at about 195 million pounds and that of secondary at about 20 million pounds, making a total of around 220 million pounds. This would be an increase of 125 per cent over the expected 1951 total.

The rated annual capacity of the six government-owned plants is 196 million pounds. This amount, plus Dow Chemical Co.'s capacity of 48 million pounds at its Freeport, Tex., plant would make a combined rated annual capacity of 254 million pounds of primary magnesium.

Copper Consumption Gains

Fabricators consumed 123,758 tons of copper in October, an increase of 8623 tons over the September figure. In the same month, their receipts of copper increased to 125,286 tons, including tonnages released from the government's stockpile. Copper content of products sold by the fabricators in October amounted to 119,298 tons compared with 115,682 tons in September.

Fabricators' visible supplies amounted to a deficit of 35,513 tons at the end of October while their undelivered purchases amounted to 43,281 tons, leaving a net stock position of only 7768 tons. With unfilled orders amounting to 317,285 tons, they have a deficit of 309,517 tons of copper.

RFC has authorized a $57 million loan to Copper Range Mining Co. for developing that company's White Pine mine, located near Ontonagon, Mich. This project is expected to yield between 70 million and 75 million pounds of copper in three years.

FAST DISPATCH OF COPPER NEEDED FROM BINGHAM MINE

. . . essential needs exceed supply by wide margin

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 24.50c, Conn. Valley; Lake 24.62½c, delivered.

Brass Ingots: 85-5-5-5 (No. 115) 27.25c; 88-10-2 (No. 215) 38.50c; 80-10-10 (No. 305) 32.25c; No. 1 yellow (No. 405) 23.25c.

Zinc: Prime western 19.50c; brass special 19.75c; intermediate 20.00c, East St. Louis; high grade 20.85c, delivered.

Lead: Common 18.80c; chemical 18.90c; corroding 18.90c, St. Louis.

Primary Aluminum: 99% plus, ingots 19.00c, pigs 18.00c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb c.l. orders.

Secondary Aluminum: Piston alloys 20.50c; No. 12 foundry alloy (No. 2 grade) 19.50c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 18.00c; grade 2, 17.75c; grade 3, 17.25c; grade 4, 16.50c.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over 24.50c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt 103.00.

Antimony: American 99-99.8% and over but not meeting specifications below 50.00c; 99.8% and over (arsenic 0.05% max., other impurities 0.1% max.) 50.50c; f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 56.50c; 25-lb pigs, 59.15c; "XX" nickel shot, 60.15c; "F" nickel shot or ingots, for addition to cast iron, 56.50c. Prices include import duty.

Mercury: Open market, spot, New York, $215-$218 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $1.50 per lb of alloy, f.o.b., Reading, Pa.

Cadmium: "Regular" straight or flat forms, $2.55 del.; special or patented shapes $2.80.

Cobalt: 97.99%, $2.40 per lb for 500 lb (kegs); $2.42 per lb for 100 lb (case); $2.47 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York 88.00c per oz.

Platinum: $90-$93 per ounce from refineries.

Palladium: $24 per troy ounce.

Iridium: $200 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Ceiling prices, cents per pound, f.o.b. mill; effective Aug. 23, 1951)

Sheet: Copper 41.68; yellow brass 38.28; commercial bronze, 95% 41.61; 90% 41.13; red brass, 85% 40.14; 80% 39.67; best quality, 39.15; nickel silver, 18% 53.14; phosphor-bronze grade A, 5% 61.07.

Rod: Copper, hot-rolled 37.53; cold-drawn 38.78; yellow brass free cutting, 32.63; commercial bronze, 95% 41.30; 90% 40.82; red brass 85% 39.83; 80% 39.36.

Seamless Tubing: Copper 41.72; yellow brass 41.29; commercial bronze, 90% 43.79; red brass, 85% 43.05.

Wire: Yellow brass 38.57; commercial bronze, 95% 41.90; 90% 41.42; red brass, 85% 40.43; 80% 39.96; best quality brass, 39.44.

(Base prices, effective Nov. 6, 1950)

Copper Wire: Bare, soft, f.o.b. eastern mills, c.l. 28.67-30.42; l.c.l. 29.17-30.92; 100,000 lb lots 28.545-30.295; weatherproof, f.o.b. eastern mills, c.l. 29.60-30.60, l.c.l. 30.10-31.10, 100,000 lb lots 29.35-30.35; magnet, del., 15,000 lb or more 34.50c, l.c.l. 35.25.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders)

Sheets and Circles: 2s and 3s mill finish c.l.

Thickness Range Inches	Widths or Diameters, In., Inc.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	30.1	...	...
0.135-0.096	12-48	30.6	...	...
0.095-0.077	12-48	31.2	29.1	33.2
0.076-0.061	12-48	31.8	29.3	33.4
0.060-0.048	12-48	32.1	29.5	33.7
0.047-0.038	12-48	32.5	29.8	34.0
0.037-0.030	12-48	32.9	30.2	34.6
0.029-0.024	12-48	33.4	30.5	35.0
0.023-0.019	12-36	34.0	31.1	35.7
0.018-0.017	12-36	34.7	31.7	36.6
0.016-0.015	12-36	35.5	32.4	37.6
0.014	12-24	36.5	33.3	38.9
0.013-0.012	12-24	37.4	34.0	39.7
0.011	12-24	38.4	35.0	41.2
0.010-0.0095	12-24	39.4	36.1	42.7
0.009-0.0085	12-24	40.6	37.2	44.4
0.008-0.0075	12-24	41.9	38.4	46.1
0.007	12-18	43.3	39.7	48.2
0.006	12-18	44.8	41.0	52.8

* Lengths 72 to 180 inches. † Maximum diameter, 26 inches.

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or distance across flats	—Round— R317-T4, 17S-T4	R317-T4	—Hexagonal— 17S-T4
0.125	52.0	....	....
0.156-0.0188	44.0	....	....
0.219-0.313	41.5	....	....
0.375	40.0	46.0	48.0
0.406	40.0	....	....
0.438	40.0	46.0	48.0
0.469	40.0	....	....
0.500	40.0	46.0	48.0
0.531	40.0	....	....
0.563	40.0	....	45.0
0.594	40.0	....	....
0.625	40.0	43.5	45.0
0.688	40.0	....	45.0
0.750-1.000	39.0	41.0	42.5
1.063	39.0	....	41.0
1.125-1.500	37.5	39.5	41.0
1.563	37.0	....	....
1.625	36.5	....	39.5
1.688-2.000	36.5	....	....

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more $24.00 per cwt; add 50c cwt 10 sq ft to 140 sq ft. Pipe: Full coils $24.00 per cwt. Traps and bends: List prices plus 65%.

ZINC

Sheets, 26.50c, f.o.b. mill 36,000 lb and over. Ribbon zinc in coils, 25.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 25.50-26.50c; over 12-in., 24.50-26.50c.

"A" NICKEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled, 77.00c. Strip, cold-rolled, 83.00c. Rods and shapes, 73.00c. Plates, 75.00c. Seamless tubes, 106.00c.

MONEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled 60.50c. Strip, cold-rolled 63.50c. Rods and shapes, 58.50c. Plates, 59.50c. Seamless tubes, 93.50c. Shot and blocks, 53.50c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.31 in. in diameter, less than 25 lb, 55.00-62.00c; 25 to 99 lb, 45.00-52.00c; 100 lb to 5000 lb, 41.00c.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forgings, $6; hot-rolled and forged bars, $6.

DAILY PRICE RECORD

1951	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Nov. 21-29	24.50	18.80	19.50	103.00	19.00	50.00	56.50	88.00
Nov. 1-20	24.50	18.80	19.50	103.00	19.00	42.00	56.50	88.00
Oct. 5-31	24.50	18.80	19.50	103.00	19.00	42.00	56.50	88.00
Oct. 4	24.50	18.80	19.50	103.00	19.00	42.00	56.50	84.75
Oct. 2-3	24.50	18.80	19.50	103.00	19.00	42.00	56.50	90.16
Oct. 1	24.50	16.80	17.50	103.00	19.00	42.00	56.50	90.16
Oct. Avg.	24.50	18.726	19.426	103.00	19.00	42.00	56.50	88.12
Sept. Avg.	24.50	16.80	17.50	103.00	19.00	42.00	56.50	90.16
Aug. Avg.	24.50	16.80	17.50	103.00	19.00	42.00	56.50	90.16
July Avg.	24.50	16.80	17.50	106.00	19.00	42.00	56.50	90.16
June Avg.	24.50	16.80	17.50	117.962	19.00	42.00	56.50	88.492
May Avg.	24.50	16.80	17.50	139.923	19.00	42.00	50.50	90.16
Apr. Avg.	24.50	16.80	17.50	145.735	19.00	42.00	50.50	90.16
Mar. Avg.	24.50	16.80	17.50	145.730	19.00	42.00	50.50	90.16

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Aluminum primary ingots, 99%, del; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked. Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

Plating Materials

Chromic Acid: 99.9% flakes, f.o.b. Philadelphia, carloads, 27.00c; 5 tons and over 27.50c; 1 to 5 tons, 28.00c; less than 1 ton 28.50c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat, rolled, 38.34c; oval 37.84c.

Nickel Anodes: Rolled oval, carbonized, carloads, 74.50c; 10,000 to 30,000 lb, 75.50c; 3000 to 10,000 lb, 76.50c, 500 to 3000 lb 77.50c; 100 to 500 lb, 79.50c; under 100 lb, 82.50c; f.o.b. Cleveland.

Nickel Chloride: 36.50c in 100 lb bags; 34.50c in lots of 400 lb through 10,000 lb; 34.00c over 10,000 lb, f.o.b. Cleveland, freight allowed on 400 lb or more.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers 77.7c; 100 or 350 lb drums only, 100 to 600 lb, 63.1c; 700 to 1900 lb, 60.6c; 2000 to 9900 lb, 58.9c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Tin Anodes: Bar, 1000 lb and over, $1.19; 500 to 999 lb, $1.195; 200 to 499 lb, $1.20; less than 200 lb, $1.215. Freight allowed east of Mississippi and north of Ohio and Potomac.

Zinc Cyanide: 100 lb drums, less than 10 drums 47.7c, 10 or more drums, 45.7c, f.o.b. Niagara Falls, N. Y.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb $1.0009; more than 2000 lb, 98.09c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Stannous Chloride (Anhydrous): In 400 lb bbl, 87.23c; 100 lb kegs 88.23c. Freight allowed.

Scrap Metals

Brass Mill Allowances

Ceiling prices in cents per pound for less than 20,000 lb, f.o.b. shipping point, effective June 26, 1951.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	21.50	21.50	20.75
Yellow Brass	19.125	18.875	17.875
Commercial Bronze			
95%	20.50	20.25	19.75
90%	20.50	20.25	19.75
Red Brass			
85%	20.25	20.00	19.375
80%	20.125	19.875	19.375
Muntz metal	18.125	17.875	17.375
Nickel silver, 10%	21.50	21.25	10.75
Phos. bronze, 5%	25.25	25.00	24.00

Copper Scrap Ceiling Prices

(Base prices, cents per pound, less than 40,000 lb f.o.b. point of shipment)

Group I: No. 1 copper 19.25; No. 2 copper wire and mixed heavy 17.75; light copper 16.50; No. 1 borings 19.25; No. 2 borings 17.75; refinery brass, 17.00 per lb of dry Cu content for 50 to 60 per cent material and 17.25 per lb for over 60 per cent material.

Group II: No. 1 soft red brass solids 18.50; No. 1 composition borings 19.25 per lb of Cu content plus 63 cents per lb of tin content; mixed brass borings 19.25 per pound of Cu content plus 60 cents per lb of tin content; unlined red car boxes 18.25; lined red car boxes 17.25; cocks and faucets 16.00; mixed brass screens 16.00; zinc bronze solids and borings 16.25.

Zinc Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment)

Unsweated zinc dross, 13.75c; new clippings and trimmings, 15.50c; engravers' and lithographers' plates, 15.50c; die cast slabs, min. 90% zinc, 13.75c; old zinc scrap, 12.25c; forming and stamping dies, 12.25c; new die cast scrap, 11.75c; old zinc die cast radiator grille, 11.50c; old die cast scrap, 10.50c.

Lead Scrap Ceiling Prices

(F.o.b. point of shipment)

Battery lead plates, 19.00c per lb of lead and antimony content, less smelting charge of 2 cents per lb of material in lots 15,000 lb or more; less 2.25c in lots less than 15,000 lb, or a flat price of 11.25c a pound of battery plates. Used storage batteries (in boxes) drained of liquid, 7.65c for 15,000 lb or more; 7.45c for less than 15,000 lb. Soft lead scrap, hard lead scrap, battery slugs, cable lead scrap or lead content of lead-covered cable scrap, 17.25c in lots of 20,000 lb or more; 16.50c in lots under 20,000 lb.

Aluminum Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment, less than 5000 lb)

Segregated plant scrap: 2s solids, copper free, 10.50, high grade borings and turnings, 8.50; No. 12 piston borings and turnings, 7.50; Mixed plant scrap: Copper-free solids, 10.00 dural type, 9.00; Obsolete scrap: Pure old cable, 10.00; sheet and sheet utensils, 7.25; old castings and forgings, 7.75; clean pistons, free of struts, 7.75; pistons with struts, 5.75.

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Steel, cast iron, bronze, magnesium, aluminum, brass and other metals all can be "briquetted" by means of a MILWAUKEE Press. It keeps scrap in your own hands and facilitates quality control. In addition, a MILWAUKEE briquetting press conserves vital time and space required for bulk scrap handling.

Capable of converting from ¾ to more than 3½ tons of scrap per hour, hydraulically-operated MILWAUKEE presses require minimum space and maintenance. Six different sizes are available to meet specific production requirements.

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Wire . . .

Wire Prices, Page 169

Boston—Small users are now able to write their own tickets to the amount of 30 tons per quarter. Until now consumers in this category were limited to five tons. Soft spots in some wire products are developing not only because of lack of demand, but also absence of CMP tickets and restrictions on use. Substantial tonnage of galvanized clothes-pin wire unexpectedly offered by one mill went begging because consumers are without tickets.

Pittsburgh — High-carbon wire is reported in better supply in this area due to lessened demand for seat springs by automobile manufacturers. It is believed a temporary condition. Demand for other grades of wire continues strong.

Los Angeles — Model change-overs limit automotive requirements but defense buying and orders from bedspring makers sustain wire demand at high level.

Sheets, Strip . . .

Sheet and Strip Prices, Page 167 & 168

Cleveland — Slackened demand for the light, flat-rolled products by consumer durable goods manufacturers has not particularly eased supply conditions in these items in this area. Mills are practically booked full for first quarter and are accepting only high-rated tonnage orders for second quarter. Expectations are, however, that despite the diversion of additional rolling time to production of light plates on the continuous mills, supply conditions in sheets and strip will ease progressively beginning first quarter.

Boston — Consumers of flat-rolled items are not specifying as much steel as in recent past quarters. Better inventories and slackening demand for durable consumer goods account for this. Converters of narrow cold-rolled strip are confronted with reductions in hot strip supply from mills converting to plate production.

Philadelphia—Sheet schedules are filled for first quarter with but slight easing in pressure. Additional reductions in allocations are expected, but to what extent will not be conjectured until second quarter allotments are out, especially volume going to the automobile industry. Lower authorizations to some producers of consumer durable goods would also have some effect.

Pittsburgh—With first quarter allotments cut for consumer durable goods producers and the cutback in automotive production, district mills note some easing in demand for carbon sheets and strip. This will be of help in accommodating some of the light plate tonnage which must be rolled on continuous strip mills. Terne and silicon sheets are in better supply but there has been improved inquiry for electrical sheets. District mills are not yet entering any carbon sheet orders for second quarter.

Cincinnati—Books of district sheet mills are not yet open for second quarter. All evidence points to sustained overall demand, although major shifts in buying, from civilian to defense requirements, are developing.

St. Louis—Softening of sheet demand is showing up amid overall flat steel scarcities. Some is attributable to advance shipments one mill succeeded in making in anticipation of a later planned cutback. The area's widely diversified, non-defense industry also is being hit harder by defense allocations of steel. Many are curtailing in preparation for a product change-over. Cold-rolled sheet mills have accepted CMP tickets through third quarter of next year.

Plates . . .

Plate Prices, Page 167

Pittsburgh—Supply continues tight with little relief seen for months to come. Several district continuous hot strip mills will continue to roll light gages which will enable the heavier rolling units to produce some of the additional heavy tonnage which NPA requested for first quarter of 1952. Canadian inquiry has been reported in the area and unfilled fourth quarter CMP tickets are still making the rounds. One of the largest barge producers in the area, due to the 56 per cent cut in its first quarter allotment from fourth quarter and 75 per cent from third quarter, will only be able to produce 10 barges during the quarter.

Boston—Since third quarter there has been a steady reduction in plate allotments and with numerous shops first quarter tonnage is barely 50 per cent of third quarter supply. Most consumers have placed orders to the extent of tickets authorized for first quarter. Demand is heavy for ¼-in. and under, but hardest pinched are fabricators requiring heavy gage stock. In some cases weldment shops have been given additional tonnage to meet high-rated defense schedules, but for the most part consumers are adjusting shop schedules to lower plate supplies.

Philadelphia—Despite talk of forthcoming cancellations emanating from Washington, few have taken place on plates which are among the tightest of steel products. Plate fabricating shops are having trouble maintaining schedules and many are adjusting them to supply. This includes both consumers of light and heavy gage plates. Additional strip mill capacity is being diverted to plates. Although construction of 24,200 freight cars has been authorized for first quarter, steel allocations have been made for but 21,100.

Los Angeles—Conversion business is diminishing. Increasing supplies of hot-metal enable district steelmakers to fully engage finishing mills with little capacity left over for conversion rolling.

Seattle — Small plate fabricators are in a bad way under current allocations and a number of plants are reducing working forces in line with curtailed operations. The supply situation is progresively worse. Consolidated Western Steel Corp., Seattle, will fabricate 1000 tons for Weyerhaeuser's kraft plant at Everett, Wash., and Chicago Bridge & Iron Co. will furnish two storage tanks, 139,000 barrel capacity, for Shell Oil Co.'s Seattle terminal.

Tubular Goods . . .

Tubular Goods Prices, Page 171

Boston—In accepting January allotments for merchant steel pipe, distributors indicate tonnage will about meet needs. Demand for first quarter shipments is exceeding supply. No galvanized pipe is offered for next month by at least one mill. Others have reduced allotments sharply. Among slowest products in tubular goods is furniture tubing. Specialties are moving better, notably for television antenna. Electric welded pipe between 4 and 8-in. diameter is difficult to obtain.

St. Louis—Pipe supplies are extremely tight again following signs a few weeks ago construction curtailment would ease them. Mill schedules are filled to April. Orders beyond that have been rejected throughout most of this quarter. Mills are urging customers to substitute black pipe, none too plentiful, for galvanized wherever possible. Zinc shortage here is acute, the principal producer in the district, American Zinc, Lead & Smelting, having had only 1500 tons of "free" metal to take care of nonrated users.

Seattle—Award of a substantial cast iron pipe contract at Bend, Oreg., is pending, Medford, Oreg., and Edmonds, Wash., have placed contracts with Pacific Cast Iron Pipe Co., Provo, Utah.

Steel Bars . . .

Bar Prices, Page 167

Chicago — Demand for forging grades of bars is particularly heavy and most consumers are unable to match fully their requirements with mill bookings, regardless of CMP allotments. A good share of this demand comes from auto makers and farm implement manufacturers. The latter are displaying considerable interest in conversion arrangements, while the former are inclined to lessen their acquisitions from this source.

Boston—One mill has opened books for second quarter on cold-drawn carbon bars and another on alloy. Carbon bars are becoming the tightest of steel products with alloys close behind. Demand is enhanced by increasing inquiries to meet defense contract requirements. One large furniture builder in the Gardner, Mass., area has booked a large direct contract for fuzes. Forge shops are among the heaviest bar consumers currently, but small arms and fuzes may pass them once the production peak is reached.

Philadelphia—Where lead time is 75 days, as in the case of alloy bars, mills have opened books for second quarter while products taking 45 days lead will open about the first of the year. Demand for carbon and alloy bars is strong and mounting for defense work.

Pittsburgh — There has been no noticeable lessening in the terrific demand for all sizes of bars. However, some improvement in sizes above 3 in. is reported. Mills believe the cut in allotments for consumer durable goods for first quarter will help absorb some of the excess tonnage that will be carried over into 1952. Canadian buyers are seeking some of the

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area's tonnage. Some producers have opened second quarter books; others have not. Unplaced fourth-quarter CMP tickets are still moving throughout the area.

Cleveland — With direct defense needs rising steadily, pressure on the bar mills is increasing. Bars now rank with plates from the standpoint of tight supply and expectations are no easing in conditions is likely for months to come. Carryover tonnage into first quarter promises to be substantial with most mills.

Los Angeles—With their hot-bar needs satisfied by directives on district bar mills, cold-drawers are booked through first quarter.

Structural Shapes . . .

Structural Shape Prices, Page 167

New York — Shipments of fabricated structural steel in October were 241,411 tons, second only to the June figure 257,066 tons, highest this year, reports the American Institute of Steel Construction. Shipments for the first 10 months this year of 2,281,374 tons were 22 per cent greater than in the like period of 1950 when 1,869,194 tons were moved.

Bookings for October, down slightly from September, were 182,894 tons, the decline reflecting short steel supply. Average monthly bookings for the first 10 months of the year were 253,514 tons, practically the same as in the like 1950 period.

Total backlog on Oct. 31 amounted to 2,640,851 tons, of which 1,052,788 tons were scheduled for fabrication within the four months following October.

Boston—Fabricating shops are operating no better than 75 per cent of capacity due to limited supply of plain material. Inability to obtain structurals will result in turning back or deferring work on a considerable volume of fabricated material taken for first quarter and covered by authorized tickets. With one large fabricator this may amount to more than 50,000 tons of work. Delays in bridges are inevitable due to sharp cutbacks in allotments to public roads, reduced to 30,000 tons. More structural capacity is being put into operation, one mill to roll shapes for the first time in 10 years.

Philadelphia—Because of restrictions on construction, new fabricated structural steel inquiry for estimates is steadily declining, but time has not elapsed to permit much if any easing in plain material. Competition among fabricators is developing for what new work is out. Most fabricators have placed tonnage to the extent of CMP tickets held for first quarter with indications they will not get enough plain material to meet their total ticket tonnage fully.

Pittsburgh — No improvement in structural supply is expected for months to come in the opinion of government officials. Some mills, however, think capacity ample to produce all that is required. They find that while they are operating at capacity pressure is not too great. Others think the bottleneck is with the fabricators and those consumers who apply for larger allotments than are needed. The strike at Pittsburgh-Des Moines Steel Co., one of the area's largest fabricators, is deadlocked for the ninth week.

Chicago — Structural fabricators who have had their operations throttled by inadequate steel supply are taking heart in DPA's announcement last week that first-quarter allocations for hospitals, schools and roads will be increased.

Seattle — Fabricating plants have comfortable backlogs but are in position to accept second quarter 1952 business. Material is increasingly tight and management is careful in bidding and making future commitments.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 167

Chicago — DPA's announcement last week of increased allotments of steel in first quarter for schools, hospitals and roads, came as welcome news to reinforcing steel suppliers. Not only can a limited number of new projects be undertaken but jobs under way and currently stymied can be completed. Demands for steel have been far beyond ability of suppliers to accommodate.

Seattle — Reinforcing bars are in strong demand. Mills are not inclined to add to current inventories. Washington state has postponed action on bids for an overpass in Snohomish county, involving 500 tons. Initial order of 250 tons reinforcing, of a total of 2800 tons, for the Eklutna, Alaska, power project, will be rolled by Bethlehem's Seattle plant.

Tin Plate . . .

Tin Plate Prices, Page 168

Washington—Export tin plate licensing methods are satisfactory, it was developed at a recent meeting of the Tin Plate Export Advisory Committee with the Office of International Trade. The limited amount of new production tin plate available for export, 115,000 tons for first quarter 1952, can be licensed only to meet essential food and petroleum packaging purposes abroad. Shipments are licensed against country quotas. By requiring license applications to be filed within a specified period in advance of each quarter, OIT is able to complete licensing in time for licensees to obtain position in mill schedules.

In the case of electrolytic unmended menders and all secondary materials, OIT processes license applications weekly in order of the date of their receipt. Wherever possible, OIT is authorizing exports of secondary materials for use in food packing in countries whose quotas of production tin plate are inadequate.

Committee members suggest quotas of secondary materials be distributed among individual exporters on the basis of their past total exports rather than on the basis of their past exports to individual countries. This would allow for the loss of markets in Iron Curtain countries.

Pittsburgh — Demand in this area continues strong. Producers are happy that NPA is going to allot the

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industry 7500 tons of pig tin of the 7755 tons originally requested for first quarter of 1952. Bulk of the tonnage will be taken from RFC stocks and the rest—over 2000 tons—will be drawn from industry inventories. Due to the possibility of price increases resulting from the current steel wage talks, consumers are putting on the pressure to have as much of their fourth quarter tonnage shipped as possible. Contract prices for 1952 will be held back by producers uitil the outcome of the wage negotiations is known.

Semifinished Steel . . .

Semifinished Prices, Page 167

Pittsburgh—The district's steel ingot rate last week was 99.98 per cent, down 3.31 per cent from the preceding week. Wheeling rate increased 0.59 per cent to 99.68 per cent. The Pittsburgh rate reflected a drop in Pittsburgh Steel Co.'s ingot operations of approximately 41 per cent due to changeover to a new blooming mill at its Monessen, Pa. plant. Excellent blast furnace output plus the fact new ingot capacity—not yet written into capacity ratings—recently put into operation are helping sustain a high production rate in this district.

Los Angeles—Shortage of semifinished steel is being eased at Kaiser steel Corp.'s Fontana Plant. Production of ingots at Fontana last week exceeded 27 per cent of total Far Western ingot production.

Scrap . . .

Scrap Prices, Page 174

Pittsburgh — District steel producers think their situation is markedly different from the national picture recently given out by NPA which reported that a sampling of 165 steel mills showed stocks of purchased scrap up to almost a 45-days' supply from April's low point of about 36 days. In this area, mill stocks have dropped to critical levels with some of the largest works down to three days' supply. Others report only sufficient stocks for 10 to 30-days' operations.

Movement was drastically cut last week due to snow storms and freezing weather.

Last Tuesday 100 district industrialists who generate scrap at their own plants visited U. S. Steel's Homestead Works at the invitation of the Area Scrap Mobilization Committee to see the extent and seriousness of the shortage at a plant that has only 3-days' supply on hand.

Demolition of an old railroad trestle to make way for Pittsburgh's Gateway Center re-development project is providing 3500 tons of scrap to the area's scrap drive.

Boston — Light material reaching yards for processing into bundles is slightly lower. Shipments of heavy melting steel are keeping pace with incoming tonnage. Steel scrap consumers have not been able to build up inventories to a safe margin. Electric furnace operators are on a hand-to-mouth supply basis. Cast scrap buying is spotty with weakness in unstripped motor blocks reported.

Philadelphia — Scrap allocations against dealers for steel mill scrap have been widespread and shipments are depleting yard stocks. Shipments to mills have been varied, most in the eastern district sharing in allocated tonnage. Nevertheless, little inventory is being accumulated. Steel mill scrap is also tight although pressure for that grade is not as tight as in steel scrap. Nearby heavy breakable and charging box cast is going to foundries by truck shipments in steady volume.

Buffalo — Dealers have resumed shipments to local mills as allocation orders to outside points have been completed. Mills, however, are deeply concerned over a sharp falling off in supplies which is coupled with heavy withdrawals from reserve stocks during the period while allocation orders were being completed. Water shipments are far below expectations. Weakness is more pronounced in the cast market, dealers reporting trouble finding large tonnage buyers.

Detroit—One of the largest mills here has been cut off from further scrap intake until other operators can build up their stocks. Many traders think the present lull in urgent demand for open-hearth scrap is a false one, and mills will be in serious trouble when winter sets in. This belief is not so strong as to foundry cast iron scrap. Plenty of presently undesirable scrap, such as uncleaned motor blocks, is available, and some dealers probably will clean more of this material to make it saleable rather than hope that demand will strengthen enough to enable them to dispose of it as is.

Cleveland — Foundries have been able to purchase substantial tonnages of Grade 2 scrap (hard steel, cut 2 feet and under) and most of them have ample stocks for immediate needs. Undertone of the market remains firm at ceiling levels, however, as all interests attempt to accumulate larger reserves for winter use. Improved prospects for a truce in Korea have had no effect on steelmaking scrap. Consumption is expected to remain heavy regardless of military developments. Low inventories constitute an extremely strong stabilizing influence on the market.

Cincinnati — Tonnage of iron and steel scrap originating in this district is slightly smaller, the decline blamed chiefly on smaller volume of industrial scrap. Inventories are far below seasonal normal. Foundry buying is active.

Chicago—Steelmaking here is edging dangerously close to reduced operations and is causing grave concern. Optimistic reports concerning scrap drives to the contrary, the two plants of United States Steel Co., largest steelmaker in the district, are down to less than 10-days' supply and inventory is dropping. NPA allocations probably will be invoked soon, but due to time lag in receiving such material may come too late to avert ingot loss. A heavy snowfall could force curtailment of operations in a matter of days. Other plants are in better position, having stocks averaging two to three weeks. Blast furnace material continues easy. Likewise, cast scrap is in comfortable supply as foundries melt more pig iron.

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scrap continue tight. End of snowy weather has convinced brokers rural areas are barren of collectable metal. Industrial scrap is moving as fast as accumulated. Mills are eating into stockpiles already down to two weeks and are deeply concerned about winter supplies. Sporadic curtailment of operations is predicted. Railroad scrap output, all under allocation, is low because dismantling programs are about completed. This puts further pressure on the fast-vanishing supply of free scrap. Biggest reported transactions of the last two weeks involved 10,000 tons of unstripped auto motors Laclede Steel was able to obtain from one broker, and a similar tonnage for Sheffield Steel Corp., Kansas City, for which five brokers were obliged to pool their resources. Auto wreckers have come through with little new metal because of labor shortages and bad weather.

Los Angeles—Improvement in supplies of steelmaking scrap has brought district mill inventories up to 22 to 45 days' supply.

Seattle—Local dealers express the opinion Seattle is the critical scrap area, material being scarcer here than elsewhere on the west coast. Seattle inventories are less than 30 days. The local shortage is due to expanded furnace and rolling operations. Elsewhere on the west coast dealers report supplies are comfortable. Some large buyers are no longer paying freight under ceiling prices. Electric furnace scrap is exceptionally tight, $41 being the going price.

Pig Iron . . .

Pig Iron Prices, Page 186

Pittsburgh—No change is noted in demand for pig iron in this district. The trend in curtailment of consumer castings for plumbing and heating equipment and other civilian products continues. Jobbing foundries making the heavier castings for plant expansions and machine tool components are extremely busy in this district. Number 4 blast furnace at U. S. Steel's Edgar Thompson Works went down for repairs Nov. 17 for an estimated 10 days. After opening-up the unit, the operators advise that more extensive work will be required and the furnace will not return to production until about Jan. 16, 1952.

Buffalo—Talk of accumulating iron because of a tapering off in foundry demands is, at least, partially offset by reports that even greater tonnage of basic material will be turned out for ingot production to make up for serious shortage of scrap. Even now, more than 75 per cent of this area's iron output is going into open hearths.

Chicago—Many jobbing gray iron foundries report operations off as much as 25 per cent due to reduced business volume. Limitations on consumer goods manufacture is causing the drop and defense orders are coming in too slowly to take up the slack. This situation is reflected in the pig iron market. For the present, supply is ample. In many cases, foundries are using more iron and less scrap in their melts. Not only is this more economical but it prevents inventories building up to exceed the prescribed 30-day limit.

Cleveland—Merchant pig iron suppliers currently are under less pressure than they were earlier in the year though they are having no difficulty disposing of all their output. Slackened foundry activities, especially at the lighter casting shops, is chief cause for the easing in pressure.

Iron Ore . . .

Iron Ore Prices, Page 173

Cleveland—Lake shipping season is drawing to a close. Ships of some fleets are tieing up for winter as soon as they arrive at lower lake ports. Others, including those of the Pittsburgh Steamship Co., will continue to haul ore as long as weather permits. Ports of Ashland and Port Arthur are closed for the season while the Northern Pacific and Soo docks at Superior also are closed. Shippers probably will meet their goal of 90 million tons. The season's total to 7 a.m., Nov. 26, came to 87,617,760 tons compared with 76,480,484 tons last year, increase of 11,137,276 tons. Movement of ore for the week ended Nov. 26 aggregated 1,257,725 tons compared with 1,161,927 tons in the like week a year ago.

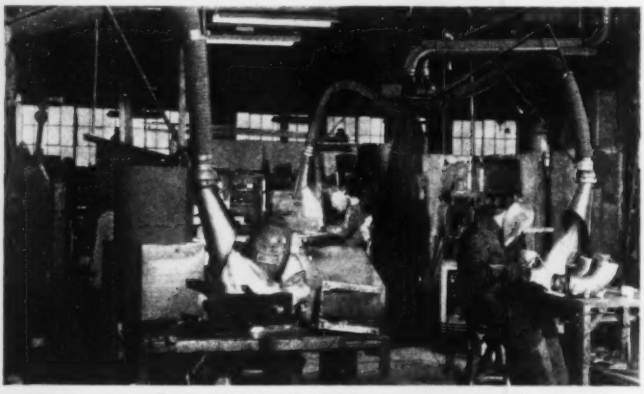
Warehouse . . .

Warehouse Prices, Page 173

Cleveland—Extent to which district warehouse price schedules will be affected by the new OPS pricing regulations is uncertain. The new warehouse order, under consideration for months, is scheduled to become effective Dec. 16. The regulations provide the warehouses with a formula for figuring their monthly ceiling prices, taking into consideration mill base product prices, plus specified warehouse percentage markups, plus average freight costs, plus extras. The warehouse markups are not uniform as between the separate marketing areas.

In the Cleveland district operators are permitted the following percentage markups: Standard structural shapes, 52; junior channels, 52; junior beams, 52; wide flange beams, 52; hot-rolled carbon bars and bar shapes, 45; hot-rolled carbon plates, 50; floor plates, 43; abrasion resisting products, 60; hot-rolled carbon sheets, 51; hot-rolled carbon strip, 54; cold-rolled sheets, 43; enameling sheets, 52; cold-rolled low carbon strip, 48; high tensile low alloy products, 48; cold-finished carbon bars, 33; reinforcing bars unfabricated, 45; tin plate, black plate and short ternes, 45.

Pittsburgh—Operators are extremely short of all items. However, they expect a slight improvement after the first of the year when 100 per cent of their base period receipts will be allowed. Present inventories have dwindled to the point where distributors can't take care of the major portion of offered business. Heretofore it was possible to offer the buyer substitutions but today this is becoming increasingly more difficult. There is a terrific demand in this district for wide flange beams and structurals. Most of the differ-



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This well ventilated welding department is typical of hundreds of similar installations. Welding operators appreciate smoke and gas-free atmosphere. Thousands in service. Many repeat orders. Collecting fumes at the source with local exhaust hoods has proven most practical in operation. It is particularly helpful in winter months when doors and windows are closed. Write for Bulletin 37-D describing all types of Ruemelin Fume Collectors.

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ent sized plates and bars continue in strong demand, and current mill shipments are not too encouraging.

Seattle—The warehouse situation is unchanged, demand in excess of supplies with inventories low. Small plants are curtailing operations because steel is not available.

Canada . . .

Toronto, Ont.—Production of pig iron in Canada in September, amounted to 212,485 net tons, against August output of 203,186 tons and for September, 1950, 199,415 tons.

In the nine months ending with September Canadian pig iron production made a new all time high of 1,884,135 net tons which compares with 1,697,451 tons in the like period of 1950 and with 1,659,003 tons in 1949.

Ferroalloys produced in September, 1951, amounted to 22,977 net tons compared with 25,327 tons in August and with 17,765 tons in September, 1950. In the first nine months this year output of ferroalloys totaled 182,207 net tons against 132,355 in the like period of 1950 and 169,536 tons in 1949.

Steel ingots and castings produced in September amounted to 268,230 net tons and compares with 286,804 tons for August.

The Dominion Bureau of Statistics revised figures showing Canada's rated capacity for production of steel ingots. For 1950 the Bureau reported total capacity at 3,976,100 net tons. This figure has been changed to 3,936,100 tons.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

825 tons, (including plates) Elkutna power plant , Alaska, to Commercial Shearing & Stamping Co., Youngstown; Palmer Constructors, Seattle, general contractors.

635 tons, bridges, traffic interchange, Longfellow bridge, Charles river, Boston, to West End Iron Works, Cambridge, Mass., through Munroe & Langstroth Co., Norwood, Mass., general contractor.

500 tons, industrial area bridge, Tacoma, Wash., to unstated Portland, Oreg., fabricator; Anderson Bridge Co. and Roy T. Early Co., Tacoma, general contractors.

STRUCTURAL STEEL PENDING

300 tons, transmission towers; bids to Bonneville Power Administration, Portland, Oreg., in December.

Unstated, Montana state bridge, Chouteau county, 297½ feet; bids to Helena, Nov. 29.

Unstated, state laboratory building, Helena, Mont.; plans in preparation.

REINFORCING BARS . . .

REINFORCING BARS PLACED

250 tons, (total reinforcing involved, 2800 tons) Elkutna power plant, Alaska, to Bethlehem Pacific Coast Steel Corp., Seattle; Palmer Constructors, Seattle, general contractors.

REINFORCING BARS PENDING

500 tons, Washington state bridge, Snohomish county; action postponed for plan revision.

PLATES . . .

PLATES PLACED

1000 tons plus, tanks for Weyerhaeuser Timber Co.'s kraft plant, Everett, Washington, to Consolidated Western Steel Corp., Seattle.

700 tons, two storage tanks, Shell Oil Co., Seattle terminals, to Chicago Bridge & Iron Co., Seattle.

PIPE . . .

CAST IRON PIPE PLACED

100 tons plus, various sizes of pipe for Medford, Oregon, to Pacific States Cast Iron Pipe Co., Provo, Utah.

100 tons, various sizes of pipe, Edmonds, Wash., to Pacific States Cast Iron Pipe Co., Provo, Utah.

RAILS, CARS . . .

RAILROAD CARS PLACED

Santa Fe, 30 mechanical refrigerator cars, equipped with diesel power refrigeration systems; to own shops.

PROMPT DELIVERY FROM STOCK

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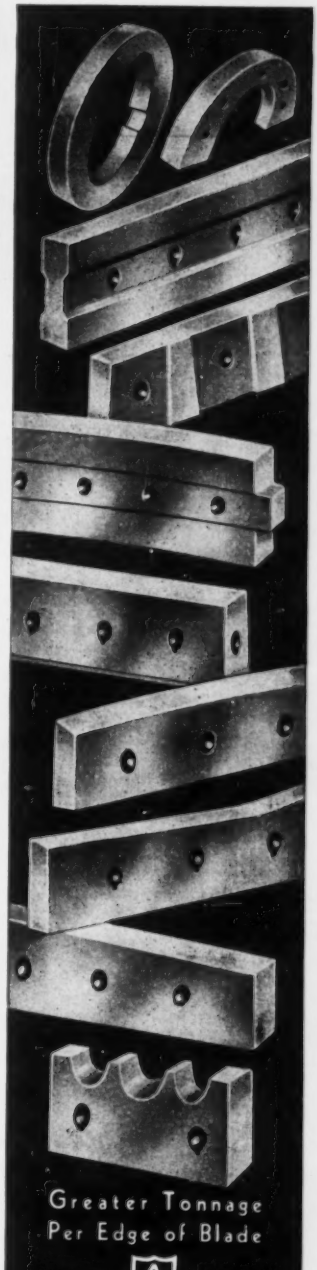

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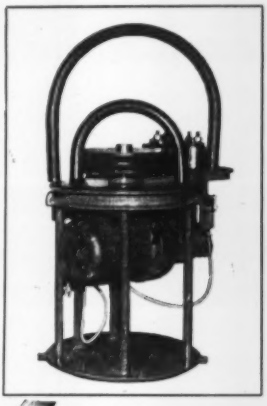
IS THIS THE SHAPE YOU WANT?

IT'S YOURS WITH A PEDRICK PRODUCTION BENDER



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Pedrick Benders perform accurately—uniformly—speedily—economically.

Equipped with relay controls for semi-automatic duplicate bending, Pedrick Benders will bend pipe up to 6" extra heavy—has no clamps—thereby eliminating many expensive tools. Pedrick Machines require no previous experience, special skills, expert supervision. They are inexpensive—keep your costs low.

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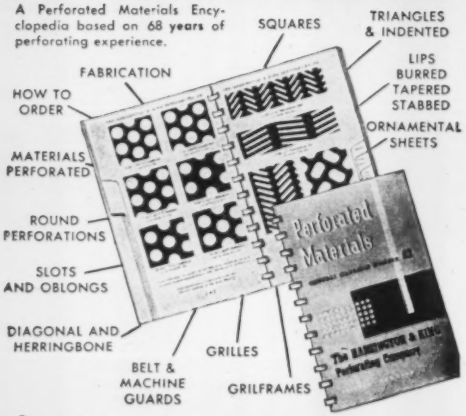

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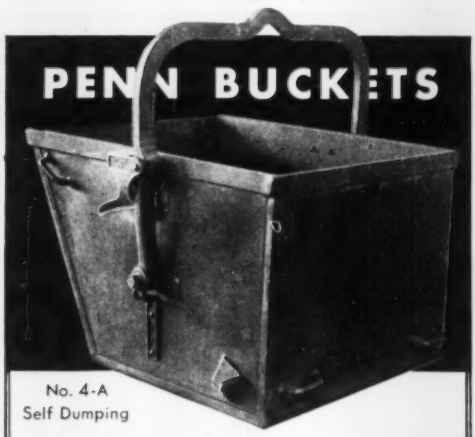

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Self Dumping

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Metalworking Briefs . . .

CONSTRUCTION—ENTERPRISE—ORGANIZATIONAL CHANGES

$20 Million Plant Planned

Hotpoint Inc., Chicago, subsidiary of General Electric Co., Schenectady, N. Y., will spend $20 million to build a manufacturing plant in Oaklawn, a suburb of Chicago, "as soon as defense restrictions permit." This will represent the final step in a postwar expansion program on which total expenditures will exceed $60 million. The new facility will add about 1 million square feet to Hotpoint's manufacturing area to a total of more than 6 million.

Keokuk Opens New Building

Keokuk Electro - Metals Co., Keokuk, Iowa, celebrates its 36th anniversary this year. A new office building, just completed, helped the firm to commemorate the occasion. Growth of the firm is indicated in the increase of its employment, from 50 in 1916 to 850 today.

Equips Machine Tool Plant

Ekstrom, Carlson & Co., Rockford, Ill., is installing additional new equipment in its $250,000 plant addition which was completed this fall. The equipment will be used for machining and assembling woodworking and metalworking machine tools.

Opens Eastern Sales Office

Des Moines Steel Co., Pittsburgh, opened an eastern sales office at 1060 Broadway, Newark, N. J. This new headquarters replaces the New York office formerly located at 270 Broadway. H. W. Ford continues as eastern district sales manager.

Enters Metalworking Field

Welding & Steel Fabrication Co. Inc. was organized in Buffalo. Incorporators are Frank J. Leofsky, John F. Youngers and Henry W. Schmidt.

Fullerton Steel Expanding

Executive and general offices are under construction at 6605 W. Fullerton, Chicago, for Fullerton Steel & Wire Co. Former office space will be converted to a warehouse.

Studies Protective Finishes

American Chemical Paint Co., Ambler, Pa., has undertaken a research program under contract with the Office of the Quartermaster General, Washington. The scope of the program will be the investigation and development of prepaint treatments and final chemical treatments of metal surfaces, for the protective finishing of designated Quartermaster articles of supply. The items to be studied include metal containers and equipment hardware.

Pittsburgh Screw To Expand

Pittsburgh Screw & Bolt Corp., Pittsburgh, plans a $1 million expansion program at its Gary, Ind., Works.

Willett To Build Addition

M. S. Willett Inc., Baltimore—tools, dies, jigs and special stampings—awarded a contract for a 2500-square foot addition to its plant. This will give the company a total of 10,000 square feet. M. S. Willett is president.

Plating Firm Organized

Metro Processing Corp. was organized in Chicago by Gus G. Sutter who was elected president. This new plating firm will be the exclusive licensee in the Midwest of the electrofilm process of California. This is a dry lubricant for moving parts.

Colson-Merriam Expanding

Colson-Merriam Co., Baltimore, manufacturer of materials handling equipment, is moving its fabricating plant to 545 W. Biddle St., that city. The space made available in the main plant will be used for the expansion of other departments. W. E. Merriam is president.

Offers Sajo Machine Tools

Austin Industrial Corp., New York, was appointed exclusive distributor in the United States and Canada for Sajo horizontal milling machines which are manufactured in Sweden.

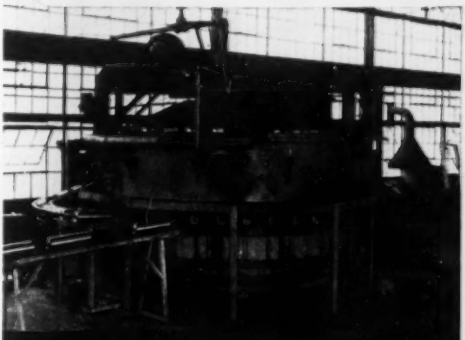
Size Control Appoints Agent

Size Control Co., Chicago, appointed Sterling Sales Inc., Worcester, Mass., as its exclusive representative in that territory. The company produces precision gages of all kinds, centerless lapping machines, and thread measuring wires.

Sells Labeling Maachine Line

Norton Co., Worcester, Mass., sold its labeling machine business to Standard-Knapp Division, Portland, Conn., of Emhart Mfg. Co., Hartford, Conn. The sale involves termination of all manufacture and selling of Norton Oslund automatic labeling machines and the sale of this entire line. Nor-

GASMACO FURNACES



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The Gasmaco Rotary Nosing-in furnace shown here is turning out 155 MM shells for defense. More accurate, more uniform heating is assured by the mechanical rotation of the shells in a water-jacketed opening, to give a sharp line of demarkation of the heat.

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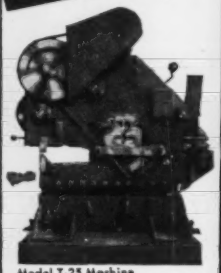

Model T-25 Machine

— *SPECIFICATIONS* —

	Model T-15	Model T-25
to Punch	7/8" x 7/16"	1" x 9/16"
to Shear		
Plates	7/16"	1/2"
Flat Bars	3" x 9/16"	3-3/16" x 5/8"
Tees	3-1/8" x 5/16"	4" x 3/8"
Angles	3-1/8" x 5/16"	4" x 3/8"
Round Bars	1-3/16"	1-3/8"
Square Bars	1"	1-1/4"

Available in Triple Combination Vertical and Horizontal Punches and Shears—also *individual* machines.

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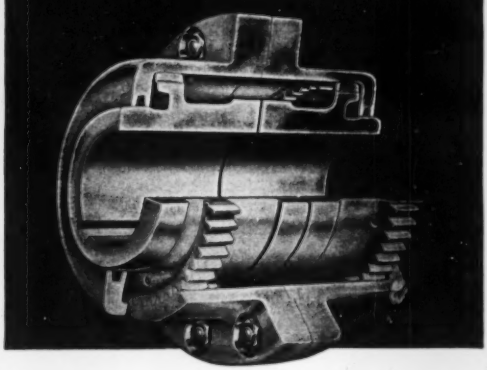

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MODERN METALWORKING MACHINES

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WELL, NO—WE'VE NEVER HAD A CHANCE TO QUOTE ON ONE, YET—BUT . . . it's like this—We make a good line of standard machines, and we're proud of them, but — we're still interested in designing & building machines to do things that haven't been done before, or to improve upon existing methods. We're prepared to compete with your own tooling department and guarantee results.

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ton Co.'s Grinding Machine Division has been building these labeling machines since October, 1946, when it purchased the Oslund Bros. Machine Co. Inc., Worcester. Standard-Knapp Division is one of the nation's leading producers of automatic packaging machines.

Makes Thread Cutting Screws

Indiana Metal Products Corp., Rochester, Ind., is now licensed to manufacture and sell thread cutting screws. The sales department of this fastener manufacturer is headed by Frank Campbell, located at 919 Michigan Ave., Chicago.

Wagner Tool & Die Organized

A business name was filed in the Erie county, New York, clerk's office for the O. Wagner Tool & Die Works, Williamsville, N. Y., by Otto Wagner.

Industrial Supply Firm Sold

Bison Industrial Supply, dealer in foundry and machine shop supplies, Buffalo, was purchased by Eugene C. Ruhlman from Warran L. Pell.

Sets Canadian Safety Record

Employees of the blast furnace department, Hamilton Works, Steel Co. of Canada Ltd., set a record of safety for heavy industry in Canada when they reached 1 million manhours of accident-free production. Not a single worker of the 341 blast furnace employees was injured seriously enough to miss a shift during the 536 days of the record.

Airplane Firm Expanding

North American Aviation Inc., Los Angeles, will add seven new buildings and hangars in the Los Angeles area. The facilities will give the company 483,300 square feet of additional manufacturing floor space.

American Can Building

American Can Co., Baltimore, has begun the erection of a warehouse which is expected to be completed by next spring.

Nolan Machinery Moves

Nolan Machinery Co. is erecting a plant in Pulaski, N. Y., for the manufacture of machine tools and machine gun parts. The business is being moved from Rome, N. Y., and is headed by Edward Nolan.

Cleco Appoints Distributors

Cleco Division, Reed Roller Bit Co., Houston, appointed W. S. Ehrenfeld Co., York, Pa.; Hillsman Equipment Co., Melrose Park, Ill.; and R. W. Hudgins & Sons, Norfolk, Va., as distributors for Cleco products in their areas. Cleco manufactures air tools and accessories.

Brass Firm Doubles Capacity

Jacques Brass Specialties Inc., Baltimore — machine shop work—acquired additional space at that address which will double its present capacity. William Stanton is president.

Chile To Get Oil Refinery

M. W. Kellogg Co., New York, is doing engineering work on Chile's first oil refinery, to be built near Valparaiso. Actual construction of the $10 million refinery will be started by Kellogg Pan American Corp., a subsidiary of M. W. Kellogg Co., in about a year.

Singer Mfg. Plans Expansion

Singer Mfg. Co., Elizabethport, N. J., will build an addition to its plant in that city. The defense expansion project will cost about $3,807,000.

American Lava Names Agent

American Lava Corp., Chattanooga, Tenn., appointed John A. Green Co., Dallas, as its sales representative. American Lava produces custom made technical ceramics, electrical insulators and thread guides.

Stampings Output Increasing

The new Ford Motor Co. stamping plant in Buffalo expects to add nearly 2000 workers in the next six to eight weeks as it swings into large scale production. Employment is now around 1500. New press installations have been made and the plant soon will be busy on stampings for the 1952 Ford.

Benchmaster Builds Plant

Benchmaster Mfg. Co., Los Angeles, is building a plant on Rosecrans boulevard, near the intersection of Western avenue, Gardena, Calif. The first unit will provide 20,000 square feet of floor space on what will eventually be a 5-acre development. Among new equipment added to present machine shop facilities will be several heavy-duty milling machines and lathes. Total investment in the plant will exceed $750,000.

Baltimore Aircoil To Move

Baltimore Aircoil Co. Inc., Baltimore, manufacturer of condensers for refrigeration and air conditioning, will consolidate its plants in that city in a building at 215 Mathes St. The new plant formerly occupied by Prefabricators Inc., contains 40,000 square feet, compared with 17,500 square feet now occupied. The company expects to be installed at the

How a Pittsburgh Brush Solved an Oil Pressure Problem*

*** An actual case history from the Allis-Chalmers Pittsburgh Works, manufacturers of transformers.**

At Allis-Chalmers, well-known manufacturer of industrial equipment, the problem was to secure a satisfactory oil pressure test on transformer radiators. The key to the problem was to find a brush narrow enough to clean between cooling fins and strong enough to remove slag and spall on welds which could conceal pinholes. Pittsburgh engineers recommended an 8" rotary wire brush. The brush proved more than satisfactory and the problem was solved!

Let Pittsburgh Engineers Solve Your Brush Problems.

Pittsburgh's complete line of brushes of every type, for every purpose, will provide a practical and economical solution of any brush problem you might have. Drop us a line on your company letterhead for a copy of our new booklet that shows, through actual case histories, how Pittsburgh can help cut your brushing operation costs. Address: PITTSBURGH PLATE GLASS COMPANY, *Brush Div.*, Dept. W14, 3221 Frederick Ave., Baltimore 29, Md.

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COST JUST A FRACTION OF METAL SPACERS

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ALWAYS RETAINS UNIFORMITY AND EVENNESS UNDER ALL NORMAL CONDITIONS

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For Concrete Reinforcing Bars

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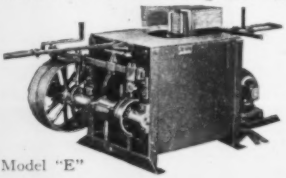

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The *Cleveland Steel Tool Co.*

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IF IT'S *RIVETED* YOU KNOW IT'S SAFE

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To Lower your Overhead..

BROWNING ELECTRIC TRAVELING CRANES AND HOISTS up to 125-TON CAPACITY

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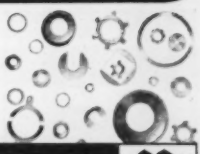
"WHITEHEAD WILL HAVE DIES FOR THESE WASHERS"

Washers are "big business" with Whitehead. Production is fast, economical. Big runs from automatic presses. U. S. Air Corps Standard washers, U. S. and S.A.E. Standards, etc. WRITE FOR CATALOG.



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any size or shape product, any size

order from the smallest to the largest

Excellent facilities for pickling and oiling

ENTERPRISE GALVANIZING COMPANY

2525 E. Cumberland Street Philadelphia 25, Pa.

new address by the end of this year. A new division to produce a propeller fan is being equipped.

Waldrip Gets Subcontract

Waldrip Sales Co., Los Angeles, received a $1.5 million subcontract from Consolidated Vultee Aircraft Corp., San Diego, Calif., to design and build tools and fabricate wing panels for a new Convair airplane.

Bechtel Leases Office Space

Bechtel Corp., Bechtel International Corp. and their affiliate firm, Geo. S. Colley Jr. & Associates, leased the entire 19th floor of the Chrysler Building East, New York. These companies are well known in the construction and engineering field.

Meloon Buys Ray Caldwell

Meloon Bronze Foundry Inc., Syracuse, purchased the Ray Caldwell Co., that city. Meloon plans to operate both plants while additions are being erected on the former Caldwell property at 1841 Le Moyne Ave. Meloon will move from its present Syracuse location after Jan. 1.

Wapakoneta Capacity

Wapakoneta Machine Co., Wapakoneta, O., is erecting a building which will increase production capacity 50 per cent. The latest type of heat-treating equipment, machining equipment and grinders will be installed.

Fenestra Moves Coast Office

Fenestra Building Panels Division, Detroit Steel Products Co., Detroit, is preparing to move into its new Los Angeles office and warehouse at 5026 E. Slausson St. T. R. Wareham is the district manager.

Diamond Alkali Expanding

Diamond Alkali Co., Cleveland, is proceeding with its plan for financing a long-range program of expansion and diversification. Plants at Painesville, O., and Houston will share in the expansion.

Baker Appoints Distributor

Baker Industrial Truck Division, Baker-Raulang Co., Cleveland, appointed W. T. Billard Inc., Los Angeles, as its representative in Southern California and Arizona.

Colombia Gets Alkali Plant

Betania alkali plant, near Bogota, Colombia, will start operations shortly after the first of the year. This $15 million plant is the first major alkali production facility ever constructed in South America and was built for Instituto de Fomento Industrial, the Colombian government agency in charge of industrialization, and the National Bank of Colombia, which controls salt properties. Operations will be directed by Arthur T. Bennett, H. K. Ferguson Co., New York.

Reed-Prentice Names Agent

Reed-Prentice Corp., Worcester, Mass., appointed Western Molders Supply Co., Los Angeles, as exclusive representative on its line of plastic injection molding machines and die casting machines in the states of California, Arizona and New Mexico.

Webb-Enston Co. Moves

Webb-Enston Co. moved to 1121 St. Clair Ave., Cleveland. The company is a distributor of industrial and automotive equipment.

Scott and Meck Merge

Merger of John Meck Industries Inc., Plymouth, Ind., into Scott Radio Laboratories Inc., Chicago, became effective Nov. 17.

Franz Co. Enlarges Plant

H. H. Franz Co., 3201 Falls Cliff Road, Baltimore general machine shop work and light assembly, is erecting a two-story addition containing 5600 square feet. H. H. Franz is owner.

Scrap Metal Firm Organized

Badger Compressing Co. was organized to handle industrial scrap metal. Offices are at 118 W. Abert Pl., Milwaukee. Harry S. Pinkus is president; A. D. Wolinsky, secretary.

UNTOUCHED BY HUMAN HAND: A pretzel-tying machine, made by American Machine and Foundry Co., produces pretzels of the hand-tied variety with great dexterity. The machine proved to be a traffic stopper when it was displayed in Buffalo

for the SPEED-UP that Checks handling costs
OWEN Scrap GRAPPLES
The OWEN BUCKET CO. 6012 BREAKWATER AVE. CLEVELAND, OHIO
BRANCHES New York, Philadelphia Chicago, Berkeley, Calif.

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"JISCO"
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FOR ACCURACY OF THREADS
LOW COST OF CHASERS
LESS DOWNTIME, 100% DEPENDABILITY
Free Bulletins
THE EASTERN MACHINE SCREW CORPORATION
22-42 BARCLAY ST., NEW HAVEN, CONN.
Pacific Coast: A. C. Behringer, 334 N. San Pedro St., Los Angeles. Canada: F. F. Barber Machinery Co., Toronto.
H&G
Insert Chaser DIE HEADS

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RAILROAD EQUIPMENT—*FOR SALE*

STANDARD GAUGE FREIGHT CARS

Box, Single Sheathed, 50-Ton
Cabooses, Eight Wheel, Cupola Type
Flats, 50-Ton, Steel Underframe, 40'0"
Gondolas, Composite or All Steel, 50-Ton and 70-Ton
Gondolas, All-Steel, 55-Ton, Solid Bottom
Hoppers, Covered, All-Steel, 50-Ton & 70-Ton
Hoppers, Twin, All-Steel, 50-Ton, Cross Dump
Hoppers, All-Steel, 70-Ton, Cross Dump
Tank, 8,000-Gallon, Class II

EXTRA LONG FLAT CARS

40 & 50-Ton Capacity, Length 70' and 74'

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Side Dump, 16-Yd., 30-Ton, Lift Door
Side Dump, 20-Yd., 40-Ton, Lift Door
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Two Plymouth Diesel-Electric, 45-Ton, Standard Gauge, Type 0-4-4-0, Built 1942

Gasoline—10-Ton to 25-Ton
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One Plymouth Model KC Flexomotive, 65-Ton, Standard Gauge, Type 0-6-0, Built 1940

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Model C, Capacity .138" to 2½" Diameter, Equipped for Manual Automatic, Foot and Auxiliary Cycling; with Hydraulic Pressure Control, Time Delay Relay, Micrometer Sizing Control; and Electrical Equipment for 440 Volts, 3 Phase, 60 Cycle Current. Also Two Sets Each ¾" and 1" Through Rolling Dies. In operation less than 6 months, condition like new. Price on inquiry.

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Serial No. 9153
Purchased New—12/23/47
2 Tank Pump—Alkali Wash & Rinse Unit
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Size of Opening—32" x 31"
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Old Style Acceptable
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2-1/16"	Rd. 10/12'	B1112	2650
27/32"	Rd. 10/12'	52100	700
HOT ROLLED BARS			
1-3/16"	Rd. 10/12'	52100	7000 #
3½"	Rd. 10/12'	52100	3400
3¼"	Rd. 10/12'	4320	1500
5"	Rd. 10/12'	4320	1100
CORE RODS			
5/16" Rd.	H.R.	14' Len.	25000 #
7/16" Rd.	H.R.	14' Len.	8000

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Price on the above $6.00 CWT., f.o.b. Southeastern shipping point.
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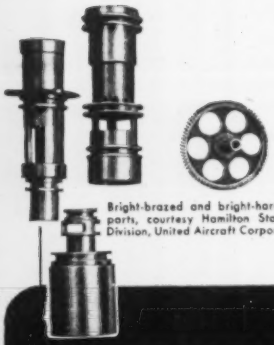

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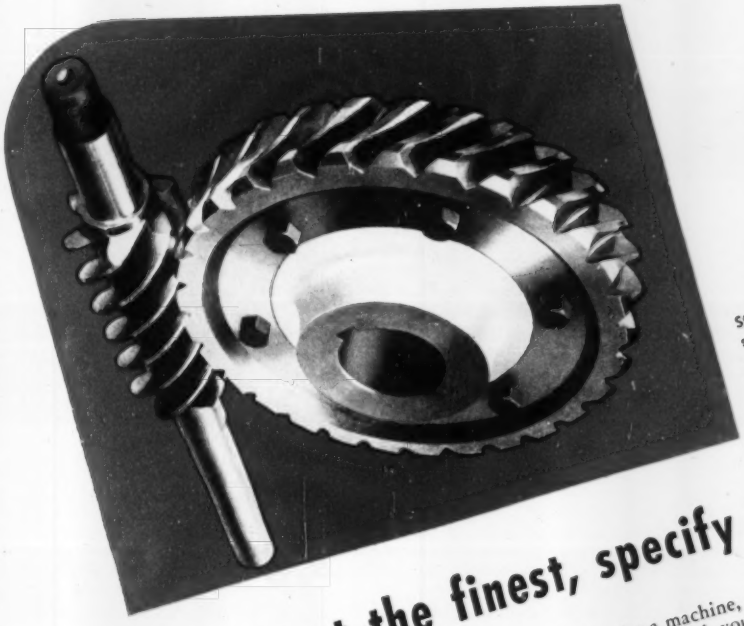

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When you want the finest, specify "Cleveland"

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Does this drive have a performance record for trouble-free, efficient service?

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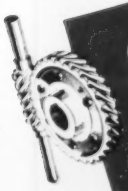

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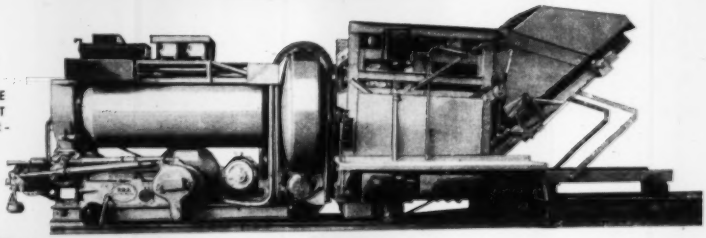
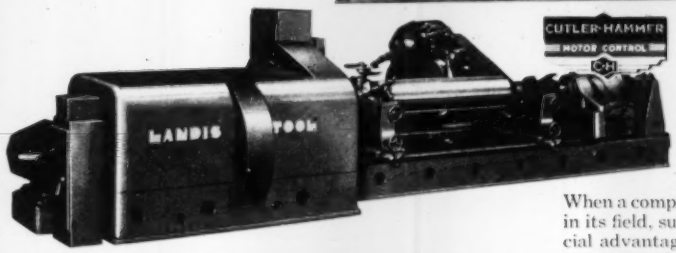
The Mark of Better Machines



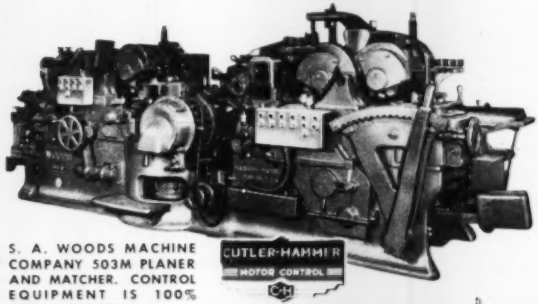
REX TUNNEL LINING PUMPCRETE MANUFACTURED BY CHAIN BELT COMPANY. 100% CUTLER-HAMMER MOTOR CONTROL



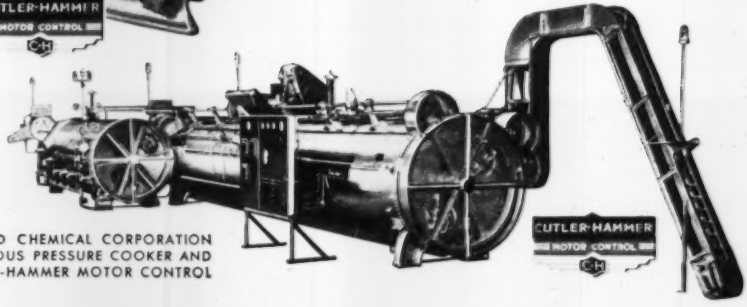
LANDIS TOOL COMPANY TYPE 30 ROLL GRINDER EQUIPPED WITH CUTLER-HAMMER MOTOR CONTROL

When Preference is backed by Purchase

When a company is widely recognized as the leader in its field, such position of commanding commercial advantage is never gained by what the company says about itself, but by what its customers *think* about it . . . and far more important, by what the customers *do* about the company's product. When a major portion of the market expresses its preference by continued *purchases* of a single manufacturer's product, the market is stating its judgment in terms that are final and unmistakable. And this is the strongest statement that can be made about Cutler-Hammer Motor Control. Leader after leader in machinery manufacture, completely aware of the tremendous struggle it took to achieve widespread preference and jealously guarding this hard-won advantage continuously and often exclusively entrust the vital control functions of their machines to Cutler-Hammer Motor Control. There is an implication here which no market-conscious manufacturer can afford to overlook. CUTLER-HAMMER, Inc., 1211 St. Paul Avenue, Milwaukee 1, Wisconsin. *Associate:* Canadian Cutler-Hammer, Ltd., Toronto, Ontario.



S. A. WOODS MACHINE COMPANY 503M PLANER AND MATCHER. CONTROL EQUIPMENT IS 100% CUTLER-HAMMER



FOOD MACHINERY AND CHEMICAL CORPORATION STERILMATIC CONTINUOUS PRESSURE COOKER AND COOLER. 100% CUTLER-HAMMER MOTOR CONTROL